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ABSTRACT

The material in this report represents some of the earliest results of field research in the languages of Nepal by the Summer Institute of Linguistics, Inc. Some of the results presented here are tentative hypotheses, subject to revision in the light of continuing research. Part I, the present volume, presents phonological data in terms of hierarchically ordered units of phoneme, syllable, stress group, etc. Following an introduction and phonological survey of seven Bodic languages of Nepal, by Austin Hale, the first paper in the section on Tone is concerned with the role of nuclei of feet in the analysis of tone in the Tibeto-Burman languages of Nepal, by Kenneth L. Pike. Other papers dealing with tone are presented by Hale, Warren W. Glover, Bruce C. Hinton, Maria Hari, Doreen Taylor, Pike, Ross Caughley, Dora Bieri, Marlene Schulze, and Kent Gordon. The section on Phonological Segments presents segmental synopses by Hale, Glover, Taylor, Hari, Caughley, Beiri, Schulze, Gordon, and Burkard Schoettelndreyer. A discussion of Sherpa vowels by Schoettelndreyer and Hale concludes this volume. See AL 002 732-4 for Parts II, III, and IV of this report. [Not available in hard copy due to marginal legibility of original document.] (AMM)

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TONE SYSTEMS OF TIBETO-BURMAN LANGUAGES OF NEPAL

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Part I

STUDIES ON TONE AND PHONOLOGICAL SEGMENTS

Kenneth L. Pike
Project Director

Austin Hale
Co-Investigator

1970

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Volume III

TONE SYSTEMS OF TIBETO-BURMAN LANGUAGES OF NEPAL

Part I: Studies on Tone and Phonological Segments

Austin Hale and Kenneth L. Pike

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Part I, Studies on Tone and Phonological Segments

Austin Hale and Kenneth L. Pike

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We are indebted to many people for making this research possible. To the University of Tribhuvan, in Nepal, we are indebted for facilities and opportunity to carry on this work. Especially we would give a word of appreciation to the Vice Chancellor, T. H. Upraity. His constant encouragement has been strengthening to us. Mr. Dor Bahadur Bista has made available to us data on the place of occurrence of these languages, with other information on customs of the people which has made our work much easier. Various governmental agencies have cooperated in helping us find people who could supply us with the language data needed.

Dr. Richard Pittman, as one of the early principle investigators on this project, initiated the analysis of some of the phonological material represented here, as well as the gathering of the first word lists. On the other hand, the major load throughout two years of research, in overseeing the analysis of the data, and in checking on their accuracy, and in editing these materials, has been carried by Dr. Austin Hale. I was myself privileged to be involved for two months on the scene, especially in the intermediate stages of work on the tone analysis.

But none of us involved in overseeing these developments could fail to be grateful for the extensive dedication and specific concrete work of the numerous members of the Summer Institute of Linguistics who come from countries far apart: Australia (Warren and Jessie Glover, Doreen Taylor), Switzerland (Dori Bieri, Annemarie Hari, Margarit Hale), Germany (Anita Maibaum, Marlene Schulze), U. S. A. (Austin Hale, Kent and Sandra Gordon), and New Zealand (Ross and Kathleen Caughley). It is the composite of the contribution of these specific members of our team as a whole which has made the work possible. Their individual contributions will be seen throughout the report.

Much of the final preparation of copy for duplication was carried out by Mrs. Phyllis Brumm and Mrs. Madeline Troyer. Special thanks are due to Mrs. Brumm for long hours of editing texts for consistency. The teams in Nepal were constantly amazed at her ability to detect inconsistencies in transcription that had escaped our best efforts at proof reading.

I am also personally grateful for a grant from the U.S. Office of Education which made it possible for me and others to attend the workshop, and helped us in many ways in the preparation of this report.

Kenneth L. Pike

Project Director

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INTRODUCTION

The material in this report represents some of the earliest results of field research in the languages of Nepal by the Summer Institute of Linguistics, Inc. Some of the results presented here are tentative hypotheses, subject to revision in the light of continuing research.

The areas of interest are many and varied. Part I of this report presents phonological data in terms of hierarchically-ordered units of phoneme, syllable, stress group, etc. Further research will allow presentation of other kinds of orderings. In particular, as more extensive morphophonemic and syntactic evidence is gathered, relations of the specifically phonological elements to the lexical and syntactic ones can be made explicit, both in terms of the distributional relations of the units of the phonological hierarchy to units of the syntactic and lexical hierarchies, as envisaged in a tagmemic approach (of special interest to Pike) and in terms of the rules of a transformational generative grammar which assign phonological interpretations to surface structures (of special interest to Hale).

Since all of the seven languages dealt with here are considered members of the Sino-Tibetan family, the analysis of tone is of particular interest. The analysis of the tone material has not been without its problems. The tone systems here described are radically different from those to which the members of the Institute have previously been exposed in their work in some 450 languages of North America, South America, New Guinea and West Africa. The Institute has, to be sure, done considerable work among the tribal groups of Viet Nam, where there are tone problems in some instances related to those we have faced in Nepal. In general, however, the tone systems of Nepal present an array of difficulties of analysis sufficiently different from those in which the Institute's tone studies in the western hemisphere have been developed that the correlation of these former studies and approaches with the kind of structure facing them on the center of the Asiatic mainland is of deep theoretical interest. The first part, therefore, focuses on this particular problem. Preliminary surveys are given of the pitch system in each of the languages studied, as it appears to the investigators at the moment, and there is an overall survey of the structures in relation to one another. It is clear that this work must continue. The difficulties of analysis were sufficiently great that they were not solved to our satisfaction in all languages, even though much progress has been made. In one respect, therefore, the tone material of this first volume is a progress report. The studies are continuing, and we hope to revise these results in the near future.

Part II of this report contains vocabulary lists from each of the seven languages. Tone is marked for all languages, although in the case of Sunwar and Tamang, the word lists went to press before the most recent analysis of tone had been written. Part II also includes some preliminary comparative work aimed at showing relationships between some of the more closely related languages of this report. In addition, a brief glottochronological study based on the Swadesh 100-word list for each of the seven languages is also included.

Parts III and IV contain text material in varying amounts for each language. These materials represent the speech of native speakers, somewhat edited by the speakers themselves so as to eliminate the psychologically relevant but syntactically irrelevant phenomena of hesitation.

As we have indicated, the project will continue beyond the bounds of these first four parts. Specifically, we have already begun extensive investigations of the clause structure of these languages, and our next phase of work in Nepal will emphasize that. We will not, however, stop with the clause, but will go upward to sentence, paragraph, and discourse, as well as downward to phrase and word structures.

Although the data of these first four parts is restricted to Nepal, we have begun work in some of the lesser known languages and dialects of India, and in future publications we hope to show that the kind of approach which enables us to gather extensive data in a Tibeto-Burman system will similarly allow us to make these data available to those governmental, university, and private agencies which desire that they be publicly available. Eventually, we hope, this should encourage further study across language barriers, and increase our understanding of those features universally shared by all human beings. When we reach this goal, we will have personally been pleased to have contributed to an understanding of our times and of ourselves, since only by understanding language as a whole, in relation to our various cultures, can we eventually understand ourselves in relation to the world in which we all live.

Austin Hale
Kenneth L. Pike

A PHONOLOGICAL SURVEY OF SEVEN BODIC LANGUAGES OF NEPAL[1]

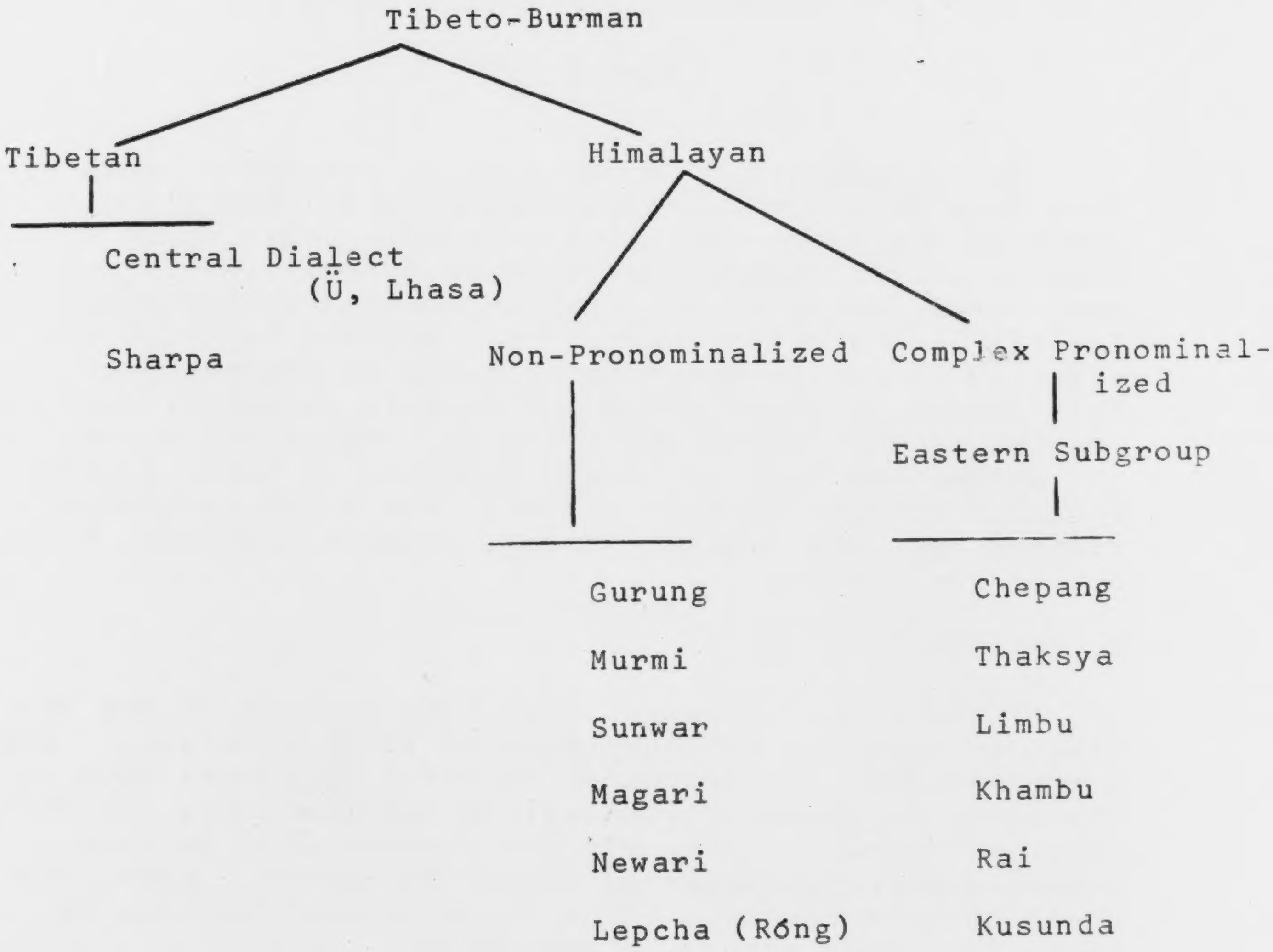
Austin Hale

The purpose of this paper is to present in summary form some of the major phonological characteristics of seven of the Bodic languages currently under study by members of the Summer Institute of Linguistics in Nepal, and, where possible, to point to similarities and differences among these phonological systems that are not revealed by the phoneme charts given in the synopses. This survey is based primarily on data papers written by members of the Summer Institute of Linguistics during the Summer and Fall of 1969. Synopses of those papers appear elsewhere in this volume. The seven languages treated here are Gurung, Tamang, Thakali, Chepang, Newari. Sunwar, and Sherpa.

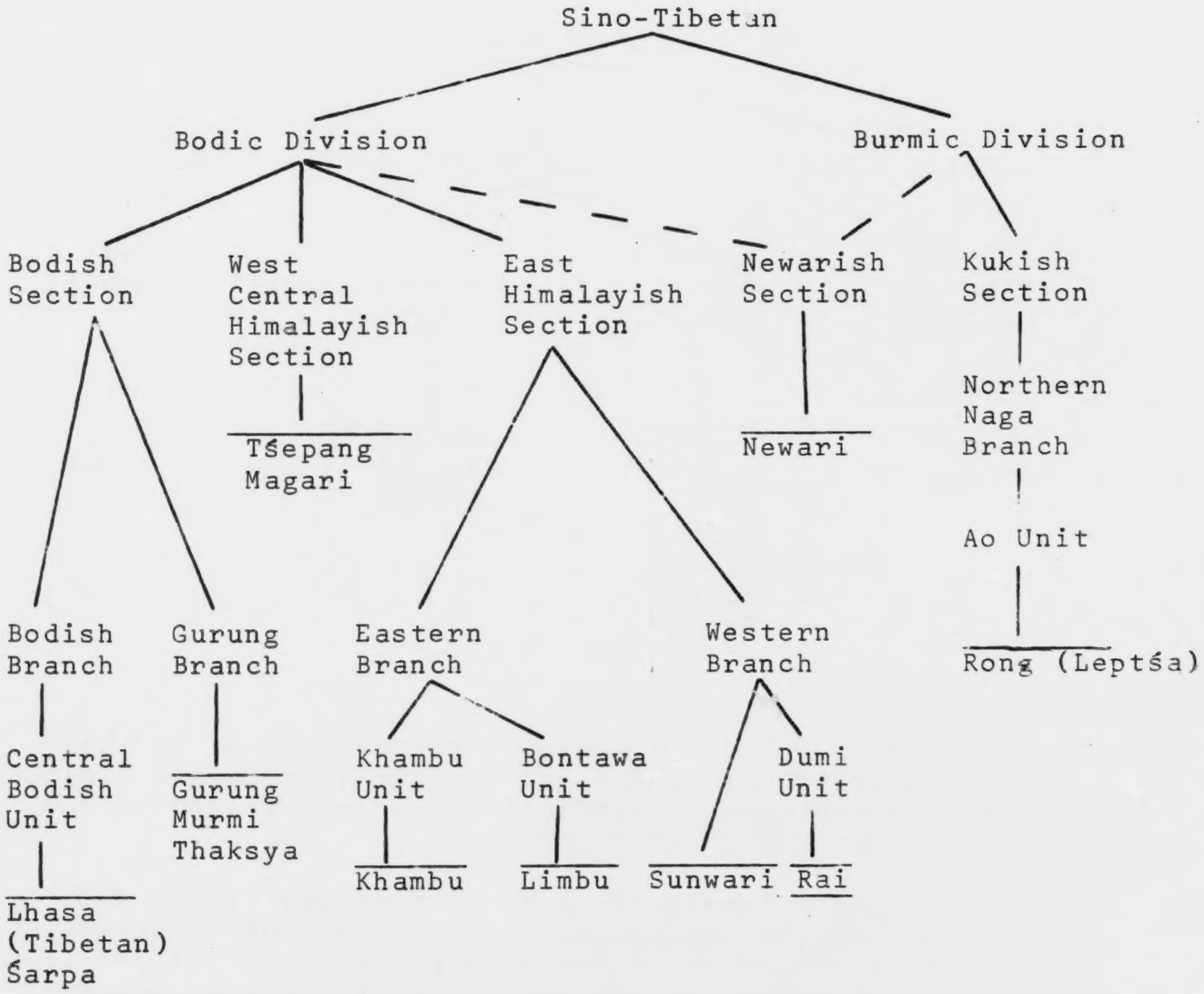
I. INTRODUCTION

These seven languages have been related to one another in terms of various kinds of classifications. For a preliminary classification of these languages made on the basis of glotto-chronological calculations, see the article 'Cognate Counts via the Swadesh List in Some Tibeto Burman Languages of Nepal' by Warren Glover, elsewhere in this report. Three other classifications of these languages should be mentioned.

Sten Konow (in Grierson (1909)) has classified these languages as follows. (Languages and groups of languages not of immediate interest have been omitted. Of the languages currently of interest to the group, Jireli, Kham, and Kaike were apparently unknown to previous classifiers.)

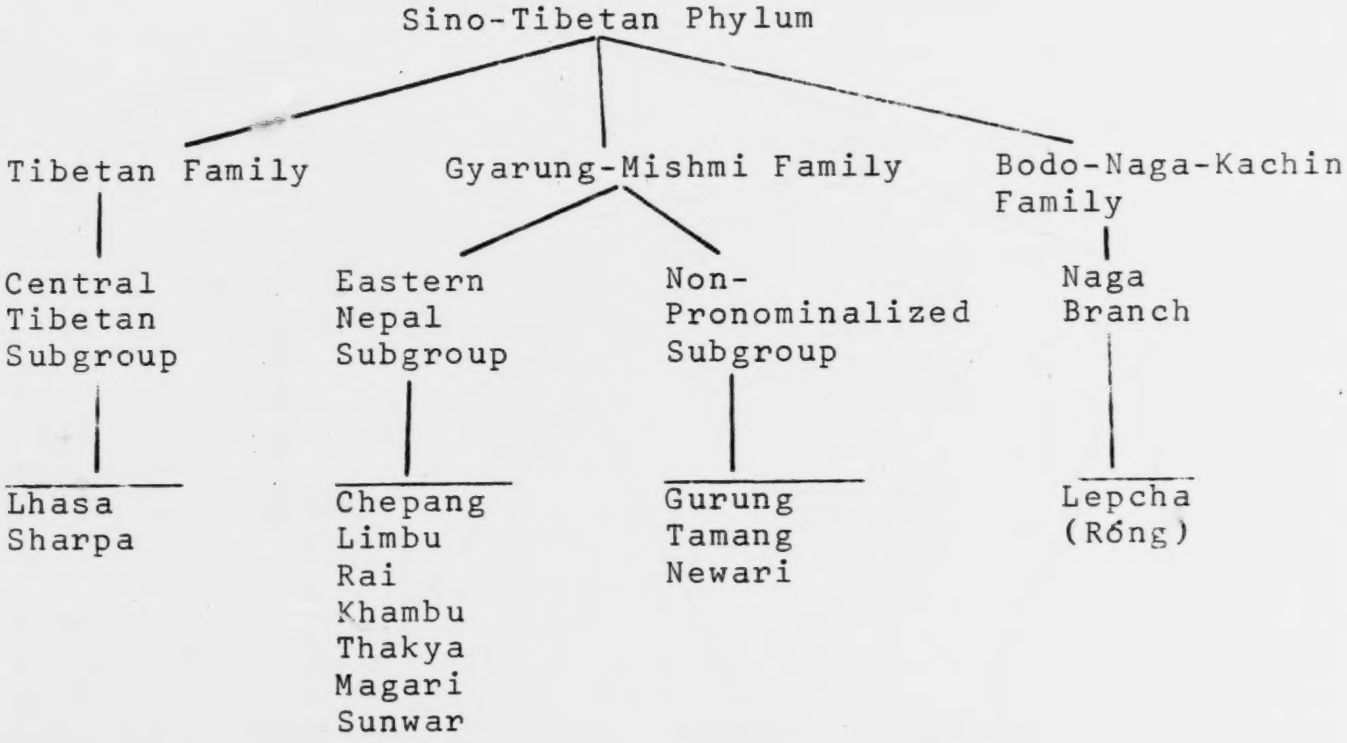

Tibeto-Burman
Tibetan
Himalayan
Central Dialect (Ü, Lhasa)
Sharpa
Non-Pronominalized
Complex Pronominalized
Eastern Subgroup
Gurung
Murmi
Sunwar
Magari
Newari
Lepcha (Róng)
Chepang
Thaksya
Limbu
Khambu
Rai
Kusunda

Konow's term, Murmi, refers to the language now more commonly referred to as Tamang and Thaksya has been identified as what is now more commonly called Thakali. S.K. Chatterji (1950:170) has related each of Konow's three major groups to a wave of migrants, the complex pronominal languages being descended from the language(s) spoken by the first wave of migrants and revealing 'Austric' (Munda) influence, the non-pronominalized group representing a second wave of migrants, the 'pure Tibeto-Burman' group, and the Tibetan languages representing a third wave of migrants, said to have arrived in the first millennium B.C. according to Buddhist tradition. The classification of Thaksya (Thakali), made on the basis of limited evidence, has proved wrong. Evidence now in hand shows it to be non-pronominalized. Robert Shafer (1955) has criticized this classification in some detail and has offered the following classification of these languages. It is interesting that Glover's classification, made on the basis of lexicostatistical computations, very nearly coincides with Shafer's classification for the languages that they both cover. Branches and languages not of immediate interest are omitted from the following diagram.


Sino-Tibetan
Bodic Division
Burmic Division
Bodish Section
West Central Himalayish Section
East Himalayish Section
Newarish Section
Kukish Section
Tšepang
Magari
Newari
Northern Naga Branch
Ao Unit
Rong (Leptša)
Bodish Branch
Gurung Branch
Eastern Branch
Western Branch
Central Bodish Unit
Gurung
Murmi
Thaksya
Khambu Unit
Bontawa Unit
Dumi Unit
Khambu
Limbu
Sunwari
Rai
Lhasa (Tibetan)
Šarpa

Shafer is not definite in his classification of Newari. He feels, however, that it is more likely to belong to the Bodic Division than it is to the Burmic Division of Sino-Tibetan

A more recent classification by Voegelin and Voegelin (1965) should also be mentioned. It critically reviews each of the two classifications given above, though the classification proposed in lieu of the above is not altogether clear as it relates to the languages of immediate interest for this report. For example, an 'Eastern Nepal Subgroup' is set up in contrast to a 'Non-Pronominalized Subgroup' yet at least three of the languages in the 'Eastern Nepal Subgroup' (Thakya, Magari, and Sunwar) are also non-pronominalized. Branches and languages not of immediate interest are omitted from the following diagram.


Sino-Tibetan Phylum
Tibetan Family
Gyarung-Mishmi Family
Bodo-Naga-Kachin Family
Central Tibetan Subgroup
Eastern Nepal Subgroup
Non-Pronominalized Subgroup
Naga Branch
Lhasa
Sharpa
Chepang
Limbu
Rai
Khambu
Thakya
Magari
Sunwar
Gurung
Tamang
Newari
Lepcha
(Róng)

Having briefly sketched various views as to their interrelatedness, we proceed to give certain non-linguistic items of background information concerning each of the seven languages of this report.

Gurung. (referred to by Burton-Page (1955) and the British Army as Gurungkura, and by the Gurungs themselves as "tamUkywihq") is spoken in Nepal by some 157,778 people[2] most of whom live in the districts of Lamjung, Syangja, Kaski, Gorkha, Tanahun, and Dhading. The dialect reported on here is that of Ghachok village, located some six miles northwest of Pokhara in Kaski District. It is estimated that this dialect is understood by about half of the Gurungs in the western hills. It is to a large extent mutually unintelligible with the dialect of Gorkha-Lamjung. Research on Gurung has been conducted by Warren and Jessie Glover since 1967. Their principal informant for this study was Deu Bahadur Gurung. He was 24 years old in 1969 and highly fluent in Nepali. All essential data were checked also with his wife, Ras Kumari Gurung, aged 31 years. She is quite illiterate and less fluent in Nepali. Both were born and raised in Ghachok.

Tamang (also referred to as Murmi, Bhotia, Ishang, and Sain) is spoken in Nepal by some 518,812 people,[2] most of whom live in Bagmati Zone in the hills surrounding Kathmandu Valley. The dialect reported on here is that of Sahugaon, located some five miles north-northwest of Trisuli Bazar in

Nuwakot District. It differs considerably from that of Rishingo studied by R. K. Sprigg in 1956. Research on Tamang has been carried on by Doreen Taylor since 1967. Her principal informants for this study have been Karna Bahadur Tamang and his brother Bhajuman Bahadur Tamang, both of Sahugaon.

Thakali (referred to in Grierson (1909) as Thaksya, in Voegelin and Voegelin (1965) as Thākya and by the Thakali themselves as "tapaang") is spoken by some 3,000 people, many of whom live, during the warmer seasons in the northern part of Dhaulagiri Zone along the upper reaches of the Kali Gandaki River which is known as the Thak Khola. The dialect described here is that of Tukche. Research on Thakali has been carried on by Maria Hari and Anita Maibaum since 1968. Principal informants for this study include Parbati Tulachen, and Mahendra Tulachan, both residents of Pokhara who were raised in Tukche, Bijay Gauchan, resident of Pokhara who was raised in Jhuma, near Tukche, and Nila Gauchan, resident of Kathmandu who was raised in Tukche.

Chepang (referred to in Shafer (1955) as 'Tšepang' and by the Chepangs themselves as "cyobang") is spoken in Nepal by some 9,274 people[2] living in the southern part of Dhading district, the western part of Makwanpur district, the northern part of Chitawan district, and the southern part of Ghorka district, an area south and west of Kathmandu. The dialect reported on here is that of Maiserang village located in Makwanpur District. Ross and Kathlene Caughley have been conducting research on Chepang since 1969. The principal informant for this study was Bhobikan Chepang, a 24 year old resident of Maiserang.

Newari (referred to in Jørgensen (1921) as 'Nevari' and by many Newars as 'Newa') is spoken as mother tongue by some 377,727 people[2] in Nepal, most of whom live in Kathmandu Valley. The dialect described here is that of Kathmandu. Research on Newari has been carried on by Austin and Margrit Hale since 1968. Principal informants for this study include Jagan Nath Maskey, born in Bhaktapur resident of Kathmandu for a number of years, Rabindra Pradhan, Kadam Mayan Rajbhandari, and Narbada Rajbhandari, all raised in Kathmandu. The analysis here presented has benefited greatly from comments by Boyd Michailovsky, U.S.A.I.D., Kathmandu, and from checking with Punya Ratna Bajracharya, of Kathmandu.

Sunwar (also referred to as Sunuwar, Sunwari, and Sunuwari) is spoken by some 13,362 people[2] most of whom live in the Likhu and Khimti River Valleys of Ramechhap, Dolakha, and Okhaldhunga Districts. The dialect described here is that of the village of Sabra in the Likhu River Valley of Ramechhap District. Dora Bieri and Marlene Schulze started research on Sunwar in 1969. The principal informants have been Hari Bahadur Sunwar, 20 years old, and his sister Devi Bina Sunwar, 22 years old, both residents of Kathmandu who were born and raised in Sabra.

Sherpa (referred to by Konow as 'Sharpa' by Shafer (1955) as 'Śarpa') is spoken by something less than the 84,223 people given in the 1961 Census of Nepal as speakers of 'Bhote Sherpa'. Since 'Bhote' is a cover term for various Tibetan dialects, the number of Sherpa speakers may be considerably less than 80,000. The traditional homeland of the Sherpas is the district of Solu-Khumbu. Sherpa speakers are also found in the Helmu and upper Trisuli Valleys.[3] The dialect described here is that of Kerung Village near Phaphlu in Solu-Khumbu District. Research on Sherpa was carried on by Luke and Marie Zylstra during 1967 and 1968, by Austin Hale during the second half of 1968, by Kent Gordon during the Summer of 1969 and by Burkhard and Heiderose Schoettelndreyer from the Fall of 1969 on. The segmental system presented here represents a modification of Gordon's analysis by Schoettelndreyer. The tone system is entirely that of Kent Gordon's analysis. The principal informants for this analysis have been Ang Gelbu Sherpa and Ang Dami Sherpa, both residents of Kathmandu who were raised in Kerung Village.

All of the work reported on here was done under the auspices of the Summer Institute of Linguistics, Nepal Branch in collaboration with Tribhuvan University, Kirtipur, and was supported in part by the Department of Health, Education, and Welfare, Office of Education, Washington, D.C. under contract number OEC-0-9-097721-2778. Each of the analyses presented here has benefited from the guidance and inspiration of Dr. Kenneth L. Pike, Chief Investigator.

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II. SEGMENTAL SURVEY

It should be noted from the outset that five kinds of transcription schemes are utilized for representing the languages reported on here, three of which are relevant to the present presentation. Not referred to here are the devanagri representation which is used for practical orthography and the roman representation used for computer applications. Relevant to this report are (1) the phonemic transcription, enclosed in slant lines, (2) the phonetic transcription, enclosed in square brackets, and (3) the roman text orthography, enclosed in double quotes. Text orthographies distinct from (but, in general, mutually convertible with) the phonemic transcription scheme have been adopted in the interests of ease in typing text. The text orthographies are phonemic in the sense that, given the relevant definitions of di- and tri-graphs, all the contrasts of the phonemic transcription are retained. The following table shows the correspondences between the more or less standard phonemic symbols used and the text orthographic adaptations made in each of the languages. Items enclosed in parentheses are interpreted phonemically as clusters for the language concerned. A hyphen in a cell indicates that the language lacks the phoneme concerned. Comments relating to specific segments in specific languages follow the table.

Phonemic Symbol	Text Orthographic Representation						
	Gurung	Tamang	Thakali	Chepang	Newari	Sunwar	Sherpa
p	p	p, b	p	p	p	p	p
p^h	ph	ph	ph	(ph)	(ph)	ph	(ph)
b	b	-	-	b	b	b	b
b^h	-	-	-	(bh)	(bh)	-	-
t	t	t, d	t	t	t	t	t
t^h	th	th	th	(th)	(th)	th	(th)
d	d	-	-	d	d	d	d
d^h	-	-	-	(dh)	(dh)	-	-
ṭ	T	T, D	T	-	-	tr	T
ṭ^h	Th	Th	Th	-	-	thr	(Th)
ḍ	D	-	-	-	-	-	D
c	ts	c, j	c	c	c	ts	ts
c^h	tsh	ch	ch	(ch)	(ch)	-	(tsh)
j	dz	-	-	j	j	dz	dz
j^h	-	-	-	(jh)	(jh)	-	-
č	(tsy)	(cy)	(cy)	-	-	-	c
č^h	(tshy)	(chy)	(chy)	-	-	-	(ch)
ǰ	(dzy)	-	-	-	-	-	j
k	k	k, g	k	k	k	k	k
k^h	kh	kh	kh	(kh)	(kh)	kh	(kh)
g	g	-	-	g	g	g	g
g^h	-	-	-	(gh)	(gh)	-	-

Phonemic Symbol	Text Orthographic Representation						
	Gurung	Tamang	Thakali	Chepang	Newari	Sunwar	Sherpa
s	s	s	s	s	s	s	s
š	(sy)	(sy)	(sy)	-	-	sh	z
z	-	-	-	-	-	z	-
m	m	m	m	m	m	m	m
M, m^h	-	-	-	hm, mh	(mh)	-	-
n	n	n	n	n	n	n	n
N, n^h	-	-	-	hn, nh	(nh)	-	-
ŋ	ng	ng	ng	ng	-	ng	ng
Ŋ, $ŋ^h$	-	-	-	hng, ngh	-	-	-
l	l	l	l	l	l	l	l
ł, l^h	(kl)	-	L	hl, lh	(lh)	-	(lh)
r	r	r	r	r	r	r	r
r̲, r^h, ɍ	-	rh	R	hr, rh	(rh)	-	(rh)
w	w	w	w	w	-	w	w
W, w^h	-	wh	-	hw, wh	-	-	-
y	y	y	y	y	-	y	y
Y, y^h	-	-	-	hy, yh	-	-	-
h	-	-	h	h	h	h	h
ʔ	-	-	-	?	-	Ø	-
i	i	i	i	i	y	i	i
e	e	e	e	e	(ya)	e	e
æ	-	-	-	-	(ay:)	-	ae
a	a	a	aa	aa	a:	a	aa
ə	-	-	-	a	a	-	-

Phonemic Symbol	Text Orthographic Representation						
	Gurung	Tamang	Thakali	Chepang	Newari	Sunwar	Sherpa
ɑ	-	-	-	-	-	a:	a
ɔ	-	-	a	-	-	-	ao
o	o	o	o	o	(wa)	o	o
u	u	u	u	u	w	u	u
Nasal Vowel							
õ	O	e;	-	-	an'	o;	oN
High Tone							
ó	oq	o:q oq	-	-	-	'ko "ko	oq
Mid Tone							
ō	-	og o:g	-	-	-	-	-
Low Tone							
ò	o	o' o:'	-	-	-	ko =ko	o
Unstressed							
o	-	o	-	-	-	-	o
Breathy Vowel							
$o^{ɦ}$	oh	oh	oh	-	-	-	-
Long Vowel							
o:	oo	(oo)	-	-	(aa)	(oo)	-
Contour Pitch	-	-	'ko	-	-	"ko =ko	-
Level Pitch	-	-	ko	-	-	'ko ko	-
Intonation I "ko	-	-	-	-	-	-	'ko

Phonemic Symbol	Text Orthographic Representation						
	Gurung	Tamang	Thakali	Chepang	Newari	Sunwar	Sherpa
Intonation II							
'ko	-	-	-	-	-	-	ko

Comments: Phonetic voicing of word-initial stops in Tamang is retained in the text orthography for various reasons, even though non-phonemic. Tamang stops are voiced word-initial under mid and low tone. They are voiceless otherwise.

In Gurung and Tamang the phonemic symbol /a/ is used to represent a low central vowel, not a front vowel, hence, "a" in these languages is also low central. Similarly, "aa" in Chepang is (short) low central.

In Tamang, /o/ is not nasalized, hence the text orthographic representation for nasal /ẽ/ has been substituted. Similarly, Newari has no /o/, thus the text orthographic representation for nasal /ə̃/ has been given. It should be noted that for long vowels in Newari, the nasal generally is represented in text orthography in a different way: /ə̃ə̃/ = "aan,".

In Tamang, the "-q" marks a morpheme as having high tone on all of its syllables, "-:q" marks a morpheme as having high tone on all syllables except the last which is unstressed. Colon, then, marks a morpheme-final unstressed syllable within a poly-syllabic morpheme, the initial syllables of which are not unstressed.

"k" is inserted where the tone or pitch mark is placed syllable-initial in text orthography.

The remainder of this survey will be presented exclusively in terms of the phonemic transcription schemes of the various languages.

A. Obstruant Systems

From the point of view of cognate counts, Gurung, Tamang, and Thakali appear to form a closely related group. On Glover's calculations, the language pairs, Gurung-Tamang and Gurung-Thakali each share some 65 percent of the Swadesh 100-word list as cognates, and the pair Thakali-Tamang shares 57 percent. The next highest percentage of shared cognates for a pair of languages in this report is 28 percent, for the pair Chepang-Newari. For this reason we will divide our presentation of obstruants into two parts, one for the closely-related Gurung, Tamang, Thakali group, and one for the remaining, less closely related group. The comments in this section will be strictly sunchronic in nature. For a comparative study, see Pittman (1970) and Pittman and Glover (1970), elsewhere in this report.

1. Gurung, Tamang, Thakali

The obstruant systems of Gurung, Tamang and Thakali have been charted in the phonemic summaries as follows:

p	t	ṭ	c	k
p^h	t^h	ṭ^h	c^h	k^h
b	d	ḍ	j	g
	s			

Gurung

p	t	ṭ	c	k
p^h	t^h	ṭ^h	c^h	k^h
	s			(h)

Tamang

p	t	ṭ	c	k
p^h	t^h	ṭ^h	c^h	k^h
	s			h

Thakali

The differences among the obstruant systems of these three languages are certainly not as great as they appear from the charts above. The major difference apparent from the charts above is that Gurung has a series of voiced stops where the other two languages do not. The facts behind these charts show this difference to be something less than a major difference.

Voicing. Voiceless stops in Gurung occur only word-initially (with the exception that /p/ and /t/ occur in word-medial geminate clusters in Nepali loans (Glover 1969b: 16)) and voiced stops in Gurung occur primarily in word-medial position. In native stock, voiced consonants occur with listed exceptions) in word-initial position only before breathy high tone vowels (Glover 1969b:17). This is indicative of a strong tendency toward a complementary distribution of voiced and voiceless obstruants in Gurung. In Tamang we do have complementary distribution of voiced and voiceless stops and affricates, but of a slightly different sort. Voiceless variants occur word-initial before high tone or unstressed tone syllables and voiced variants occur word-initial before low or mid tone syllables, and word-medially following breathy vowels (Taylor 1969b:4, 8-11). Elsewhere obstruants are phonetically indeterminate for voicing. In Thakali the distribution of phonetically voiced obstruants is more limited than in the other two. Obstruants are voiced following voiced consonants (Hari 1969:9-13).

Aspiration and Breathiness. These three languages share certain major constraints on word structure.

1. Breathy vowels occur freely only in word-initial syllables (Hari 1969:36, Taylor 1969b:35, Glover 1969b:51 f. Gurung has some exceptions to this. Tamang and Thakali exceptions result from prefixation.)

2. Only clear vowels occur freely following (phonemically) aspirated obstruants. (Hari 1969:37-38, Taylor 1969b:28, Glover 1969b:16. Tamang has one exception to this.)

3. Aspirated obstruants occur freely only in word-initial position. (The major exception in Gurung is that they follow the negative prefix (Glover 1969b:16). There are more exceptions to this in Thakali and in Tamang than in Gurung).

In Tamang there is a further constraint to the effect that only clear vowels occur in unstressed syllables (Taylor 1969b:32). Aspiration and breathiness are even further associated with one another in Gurung, where voiced obstruants are phonetically aspirated before breathy vowels, and unaspirated elsewhere (Glover 1969b:11-16). It should be noted here, perhaps, that the situation in Newari is just the reverse of this. Newari has no contrastively breathy vowels, but it does have contrastively aspirated voiced obstruants (which are viewed phonemically as clusters). Following aspirated voiced obstruants, vowels in Newari are phonetically breathy (Hale 1969:33).

One final difference among the three obstruant systems deserves comment here. Thakali has a glottal fricative /h/ which Gurung does not have. Thakali /h/ may be classified as an aspirate since, like the aspirated stops, affricates, and liquids /ł/, /r̲/ it occurs only word-initial before clear vowels (exceptions to the word-initial constraint involve the negative prefix). Taylor reports [h] in Tamang as the non-phonemic onset of a word-initial breathy vowel (Taylor 1969:12). In later work on tone, Hari has noted a contrast between breathy onset [ɦ] and voiceless consonant [h]. This contrast is important for the tone system and leads to the conclusion that Tamang has /h/. Nothing parallel to this is reported for Gurung.

2. Chepang, Newari, Sunwar, Sherpa

The obstruant systems of Chepang, Newari, Sunwar, and Sherpa may be charted as follows:

p	t	c	k	?
b	d	j	g	
	s			h

Chepang

p	t	c	k	
b	d	j	g	
	s			h

Newari

p	t	ṭ	c	k	?
p^h	t^h	$ṭ^h$		k^h	
b	d		j	g	
	s		š		h
	z				

Sunwar

p	t	ṭ	c	č	k	
b	d	ḍ	j	ǰ	g	
	s			š		h

Sherpa

Superficial differences in the charts above belie basic similarities in the systems they represent. The following discussion deals with these differences.

Aspiration. Phonetically speaking, all seven languages have aspirated stops. The decision concerning whether aspirated stops should be interpreted as clusters or as units was not uniformly motivated across the seven languages. There were two kinds of considerations involved: (1) the availability of non-suspect precedent patterns, (2) evidence provided by sequential constraints and the freedom of concatenation of certain segment types with certain others. These two kinds of considerations occasionally led in divergent directions.

In Newari, for example, /h/ occurs following all syllable-initial consonants except /s/ (Hale 1969:21-22). The aspirate /h/ also occurs by itself as a syllable-initial consonant (Hale 1969:14). However, the only non-suspect initial CC-cluster which could be used as a precedent is a loan pattern, the second member of which is phonetically [ř], but which, if all other loans are excluded is phonemically interpreted as /d/ (Hale 1969:12-13). Thus, if loan patterns are rejected and native, non-suspect precedent patterns are required as a basis for establishing initial CC-clusters, the Newari system of stops is the following:

p	t	c	k
p^h	t^h	c^h	k^h
b	d	j	g
b^h	d^h	j^h	g^h

On the other hand, if one argues that freedom of concatenation with initial stops, liquids, and nasals establishes /h/ as a separate segment everywhere, one is led to the system given in the phonemic summary. The following chart reflects divergences in the distribution of /h/ and in the availability of precedent patterns from language to language. The chart may help reveal parallels which the inventories themselves fail to show. The numbered columns contain answers to the following questions: (1) Does /h/ occur as C in CV syllables? (2) Does /h/ occur with consonants other than stops and affricates? (3) Are there non-suspect precedent patterns for the syllable-initial clusters that would result if aspirates were interpreted as clusters with /h/?

	1	2	3
Gurung	No	No	No
Tamang	Yes	Yes	No
Thakali	Yes	Yes	No
Chepang	Yes	Yes	Yes
Newari	Yes	Yes	No
Sunwar	Yes	No	No
Sherpa	Yes	Yes	No

(As noted above, the word-initial [h] in the 'Tamang Phonemic Synopsis' is viewed as a part of the manifestation of initial breathy vowel. In Hari, 'Tamang Tone and Higher Levels' /h/ is shown to be a phoneme. If one accepts loan patterns the answer to (3) for Newari is 'Yes'.) Where all the answers for a given language are 'No', as in Gurung, a unit-phoneme solution is indicated by both lines of argumentation. Where all are 'Yes', as in Chepang, both lines of argumentation point to a cluster interpretation of aspirated stops. In other cases the arguments are likely to conflict.

Retroflexion. Phonetic fronting and backing of apical stops has been noted in the summaries for all languages except Sunwar. In Newari and Chepang, the fronting and backing of these stops may be predicted to a certain level of free fluctuation in terms of environment, notably in terms of following high vowels (Hale 1969:10-11, Caughley 1969:4). In Thakali and Tamang the interpretation is straightforward, since /ṭ/ contrasts not only with other stops but also with the cluster /tr/ (Hari 1969:5, 32-33). In Gurung the contrast of /ṭ/ and /tr/ seems always to involve loan words (Glover 1969:19). In Sherpa there are no syllable-initial clusters in which /r/ follows a stop (Gordon 1969:26). The interpretation of the retroflex stops as the clusters /tr/ and /dr/ is thus not opposed by conflicting evidence from the system of clusters in Sherpa. It would, however, run foul of considerations involving sequential constraints, since /r/ as the second segment of an initial CC- cluster would be virtually bound to /t/ and /d/. Further, non-suspect precedent patterns could not be used as support, since, if clusters could be posited only when supported by such patterns, not only would the retroflex series be retained, but a palatal and labial series would also be added to the present inventory.

Affrication. All seven languages have affricates, and in all seven they have been interpreted as units and not as clusters. This interpretation is supported uniformly by restrictions on the distribution of /s/ following initial stops. With the exception of Sunwar, where there is no aspirated affricate, affricates are represented in each of the stop series. In languages where voicing is contrastive for affricates, the lack of contrastive voiced fricatives may also be viewed as support for the unit interpretation.

Grooving. Contrastively grooved fricatives have been noted for Sunwar and Sherpa, and a grooved series of affricates contrasts with an ungrooved series for Sherpa. In neither case has a cluster solution been possible for the fricatives since /sy/ contrasts with /šy/ in both languages (Bieri-Schulze 1969:23, Gordon 1969:27), and /cy/ contrasts with /čy/ in Sherpa (Gordon 1969:14). For other languages of this report grooving is viewed as conditioned variation. In Gurung and Tamang, affricates and /s/ are grooved before /y/ (Glover 1969b:14-15a, Taylor 1969b:11, 12). In Thakali, affricates are grooved before /y/ and before non-low front vowels (Hari 1969:11, 15). In Chepang affricates and /s/ are grooved before front vowels (Caughley 1969:9-11). In Newari, affricates and /s/ appear always susceptible to some grooving, but tend to be more grooved before non-syllabic /i/ and /u/ than in other environments (Hale 1969:9).

B. Sonant Systems

The sonants of the languages of this report enter to a much smaller degree into the constraints on word structure.

than do the obstruants. Aside from the voiceless liquids in Thakali /ɬ/ and /$\underline{r}$/, none of the constraints stated above on the occurrence of syllable-initial obstruants in breathy syllables, or clear syllables, or in syllables of a particular tone hold for the sonants of these languages. The sonant systems of the languages of this report may be represented as follows:

Gurung	Tamang	Thakali	Chepang	
m n ŋ	m n ŋ	m n ŋ	m n ŋ	M N Ŋ
l r	l r r^h	l r	l r	L R
w y	w w^h y	ɬ $\underline{r}$	w y	W Y
		w y		

Newari	Sunwar	Sherpa
m n	m n ŋ	m n ŋ
l (r)	l r	l r
	w y	w y

1. Gurung, Tamang, Thakali

The primary differences among the sonant systems of these three languages can be located in the aspirate (or voiceless) sonants. Those in Thakali work like the other aspirates in Thakali in that they occur only word-initial before clear vowels (Hari 1969:21). In the limited examples we have of Tamang aspirate sonants it is difficult to see a pattern. They do appear to be restricted to word-initial position, but since they appear before breathy vowels, they do not pattern like aspirates, and since they occur both before high tone and before low tone vowels, they do not pattern like the voiceless obstruants (Taylor 1969:17, 19, 23).

2. Chepang, Newari, Sunwar, Sherpa

Sunwar and Sherpa exemplify the primary pattern for sonant systems and require no discussion other than to say that the Sherpa account of aspirates treats /lh/ and /rh/ as clusters. Though there appear to be some restrictions on the occurrence of voiced and voiceless stops in phonological feet according to the tone of the foot (tone-1 feet have voiceless stops in foot-initial position, voiced stops do not occur there) these restrictions do not appear to apply to sonants. The constraint that aspirated consonants do not occur as the intial consonants of tone-2 intonation-2 feet would, however, seem to apply (Gordon 1969:42).

In Chepang each of the sonants is paired with another sonant for voicing, or, alternatively, for aspiration. In general, the pitch of a syllable is at least partly conditioned by the voicing or voicelessness of a syllable final consonant (syllables with voiceless final consonants are shorter in length and higher in pitch than syllables with voiced final consonants or than open syllables (Caughley 1969:21)). Sonants in Chepang thus seem to be exceptional for this set of languages in that they participate quite as fully in the systems of higher level prosodies as do the obstruants. If the Chepang voiceless sonants were interpreted as aspirates, Chepang would also exemplify the primary pattern for sonant systems since aspiration is treated as phonemic clustering with /h/ in Chepang.

Newari appears to have the most attenuated sonant system of the languages reported on here. Phonetically all of the languages reported on here have [ŋ]. In Newari this phone has been attributed (1) to regressive assimilation of /n/ to [ŋ] before velar stops /g/ and /k/, and (2) to an optional velar release of long nasal vowels. In Kathmandu Newari [ŋ] does not occur in syllable-initial position in contrast to Bhaktapur Newari in which it does, and in which /ŋ/ is a phoneme. Syllable-initial /ny/ in Kathmandu Newari appears to correspond to syllable-initial /ŋ/ in Bhaktapur. The gap recorded above thus represents one dialect, and not the most archaic one at that. Had Bhaktapur Newari been the dialect chosen for analysis, all languages would have had the same three points of articulation for nasal consonants.

Newari has both [ř] and [řh] phonetically. In native words, [d] and [dh] occur word-initially and [ř] and [řh] predominate in other positions, though in some native words (such as /mə-du/ 'not-is') both forms occur in non-initial position as free variants. In loan words, however, we get both [d] in non-initial position and [ř] in initial position, though the occurrence of [ə] before 'initial' [ř] in loans allows these latter cases to be re-interpreted on the pattern of native words. It may be the case that for some unsophisticated speakers, particularly the older ones, /ř/ may not be a phoneme. For educated speakers it certainly is a phoneme, but only by reason of contrasts brought into the language with loan words.

The glides /y/ and /w/ are missing in Newari because they do not contrast with the vowels /i/ and /u/. For an account of their treatment, see the 'Newari Phonemic Synopsis', below.

C. Vowel Systems

The following tables summarize what is contrastive for the vowel systems of the languages of this report. The analyses reported on here range from four to six vowels, from two to three contrastive tongue heights, and from two to three contrastive tongue positions (front to back).

Gurung, Tamang

i		u
e		o
	a	

Thakali, Sunwar, Sherpa

i	u
e	o
a	ɑ

Newari

i	u
a	ə

Chepang

i		u
e	ə	o
	a	

These contrasting vowel qualities combine with the series generating components, nasalization, breathiness, and length as follows:

	Gurung	Tamang	Thakali	Chepang	Newari	Sunwar	Sherpa
Nasal	1	2	3	3	1	1	1
Breath	1	1	1	3	3	3	3
Length	3	1	3	3	1	1	3

1. Contrastive for all vowels
2. Rare, contrastive only for /e/ and /a/
3. Non-contrastive

The lack of mid vowels in Newari deserves some comment in the light of what appears to be an area-wide tendency for disyllabic VV patterns to fuse into a single phonetic peak of resonance. The interpretation of VV patterns is a major problem for many languages of the area. The problem is sufficiently severe that the determination of CVC patterns is often the last interpretative decision to be made in the basic phonological analysis, requiring motivation from the analysis of tone as well as from segmental distribution and morphology.

This problem is not restricted to the Sino-Tibetan languages of Nepal. In Nepali, for example, one must decide whether a slight rearticulation within a peak of resonance counts as a syllable boundary. The issue is more easily settled if morphological evidence is allowed to bear on the problem. In Nepali there are words such as the following:

[tio]	'here'	[tau]	'a sheet of paper'
[thii]	'(she) was'	[pii]	'(she) drank'

in which both vowels may be heard as full vowels separated by slight rearticulation within a single peak of resonance. Consider the alternatives in the light of morphological evidence. If [thii] '(she) was' is viewed as monosyllabic, then vowel length becomes contrastive within the syllable, because of words like the following:

[ni]	'what about?'
[ti]	'those'

So far as we can determine from our data, however, this would make /i:/ the only long vowel in the language, and the only instances of this long vowel would be instances in which the vowel has an internal morpheme boundary. We have concluded, therefore, that VV sequences in Nepali are disyllabic.

In Glover, 'Gurung Phonemic Synopsis' (elsewhere in this report) vowel length was interpreted as contrastive within the syllable. This, however, led to interpretive problems with respect to tone as is indicated in Hale and Glover 'A Note on Glides, Syllabicity and Tone in Gurung' (elsewhere in this report). On the former analysis, length was contrastive for /a/ (the long member of which was a rearticulated vowel of different quality from its short counterpart). No examples of length contrast have been found for /i/ and /u/ and only one example each has been found for /e/ and /o/. Our more recent analysis holds that long (rearticulated) vowels in Gurung are phonemically disyllabic but that phonetically they manifest a single peak of resonance with medial rearticulation.

In Tamang, contrast between short and long is found in all vowels. Long vowels are not rearticulated. Vowel clusters are interpreted in Taylor, 'Tamang Phonemic Synopsis' as disyllabic and in Hari, et. al. 'Tamang Tone and Higher Levels' as monosyllabic. The monosyllabic interpretation rests largely on distributional considerations, though the parallelism between the rearticulation in geminate vowels and in heterorganic clusters is not present in Tamang as it is in Nepali and Gurung, thus providing some phonetic support for the monosyllabic interpretation as well.

Similar problems have been noted in Sherpa, but perhaps the most dramatic manifestation of this kind of tendency is found in Newari. Contraction is one of the more salient characteristics of Newari phonology. Without the use of morphological evidence, it would have been very difficult to arrive at a satisfying segmental analysis of the phonology.

In Newari we have found no contrast between [e], [ʸe] and [yə], nor have we found contrast between [o], [ʷo] and [wə]. There is, however, a relationship between short stems with the vocalic nucleus [e] / [ʸe] and long stems with the nucleus [yɔ:]. If [e] / [ʸe] is interpreted as a cluster /yə/ this relation becomes transparent as a lengthening to /yəə/, since short /ə/ is fronted and raised after /y/, but long /əə/ is not. One finds, furthermore, that a clarity norm disyllabic [ae] is normally contracted to a monosyllabic [ᵊæ] or simply to [æ:] in normal slow speech, and that [əe] contracts to [ᵊɛ] or [ɛ:] in the same way. Morphological considerations thus lead to a four vowel system for Newari, with the vowel qualities [e], [o], [ɛ:] and [æ:] being derived from the underlying clusters /iə/, /uə/, /əi'/ and /ai'/ respectively (where /i'/ is a representation for a contracting syllable of the form /iə/.) On this analysis, it is possible, for example, to explain why the addition of the locative affix /iə/ (contracting to /i'/) to nouns ending in /a/ results in [ᵊæ] / [æ:] and why the addition of locative to nouns ending in /ə/ results in [ᵊɛ] / [ɛ:]. Similar processes are observed in the infinitive forms of verbs. These latter two phonetic forms result from a regular rule of contraction operating upon certain disyllabic sequences. It constitutes a clear, though complex, example of an area-wide tendency.

The phonetic detail that we have on the vowels of the seven languages varies greatly from language to language. For statements regarding the conditioned variants of the vowels, the reader is referred to the phonemic synopses. In the case of Sherpa, the reader should see Schoettelndreyer et. al. 'A Note on Sherpa Vowels' (elsewhere in this report) for the current analysis and the considerations that lead to it.

III. TONE SURVEY

Under the heading of 'tone' we shall be discussing those phonological contrasts that relate to lexical pitch. Lexical pitch appears to be entirely non-contrastive for Newari, independently contrastive in Sunwar and Sherpa, related to breathiness (laxness) in Gurung, Tamang and Thakali, and related to the voicing of syllable-final consonants in Chepang. We will consider each system separately.

Gurung

In Gurung the major characteristics of lexical pitch may be described in terms of two contrastive components, accent and voice quality (breathiness). The distribution of these is restricted within the word in the following ways.

1. The breathy-clear contrast is marked only on the initial syllable of the word. (There are a few listable exceptions in the nature of compounds, see Glover 1969b:51-53).
2. A word may have one accented syllable or none.

Ignoring quadri-syllabic words, of which we have so few as to make significant generalization impossible at present, these constraints combine to yield the following patterns: (S = clear, unaccented syllable; Sh = breathy unaccented syllable; Sq = clear accented syllable, Shq = breathy accented syllable.)

Monosyllabic patterns	clear	breathy
Unaccented	1. S	2. Sh
Accented	3. Sq	4. Shq
Disyllabic Patterns		
Unaccented	5. SS	6. ShS
Accented	7. SqS	8. ShqS
	9. SSq	10. ShSq

Trisyllabic Patterns	clear	breathy
Unaccented	11. SSS	12. ShSS
Accented	13. SqSS	14. ShqSS
	15. SSqS	16. ShSqS
	17. SSSq	18. ShSSq

Of these patterns, (18) has not been observed and there appears to be no contrast between (6) and (10) in stop-initial nouns. The pitch patterns predicted for these word types are as follows (H = high pitch, M = mid, L = low, L-M = low to mid glide, / = fluctuates with).

For word-initial syllables:

1. Sq has high pitch
2. S has mid pitch
3. Sh has low pitch
4. Shq has a low to mid glide

For non-initial syllables:

1. S has low pitch following Sh, but mid pitch following S, Sq, and Shq.
2. Sq has high pitch fluctuating with mid pitch following S, but mid pitch following Sh.

These rules generate the following patterns: Monosyllabic pitch patterns: 1. M, 2. L, 3. H, 4. L-M. Disyllabic pitch patterns: 5. M + M, 6. L + L, 7. H + H / H + M, 8. L-M + M, 9. M + H / M + M, 10. L + M. Trisyllabic pitch patterns: 11. M + M + M, 12. L + L + L, 13. H + M + M, 14. L-M + M + M, 15. M + H + M / M + M + M, 16. L + M + M / L + M + H. 17. M + M + H / M + M + M, 18. L + L + M / L + L + H.

Certain minor variants of lexical pitch are conditioned by other factors. 'High' pitch is phonetically lower on the second and third syllable of a word than it is on the first. Nasality in the vowel raises the pitch of the syllable. Other things being equal, /i/ raises the pitch of a syllable, /o/ lowers it. Voiced stops lower the pitch of a clear unaccented initial syllable.

The dialect of Gurung reported on here appears to differ from that of Ghandrung, reported on by J. Burton-Page (1955:111-116) in that the breathiness contrast is present in the latter, but not the accent phenomena described here. The word patterns listed above may be illustrated with the following words:

1.	"mi"	/mi/	[mʸī]	'fire, tail'
2.	"tuh"	/tuh/	[t͓ùʱ]	'bucket'
3.	"sOq"	/sṓ/	[sɔ̄́]	'three'
4.	"mehq"	/méʰ/	[mʸɛ͓ʱ]	'cow'
5.	"khyodo"	/kʰyodõ/	[kʰyɔ̄d͓ɔ̄]	'domestic animal'
6.	"tsyohqO"	/cyohqo/	[ts̆ɔ̀ʱqɔ̄̀]	'pantry'
7.	"Thiqba"	/ṭʰíba/	[ṭʰī́ƀə̄]/[ṭʰíƀə́]	'to strike a match'
8.	"Dyahqppa"	/ḍyáʰppa/	[ḍʱy̽ʱə̄ʱp:ə̄]	'mechanism'
9.	"aliq"	/alī́/	[ə̄lí]/[ə̄lī]	'clod of earth'
10.	"dzahdzaq"	/jaʰjá/	[dzʱə̀ʱdzə̄]	'calf'
11.	"tagara"	/tagara/	[tə̄gə̄r̽ə̄]	'gate post'
12.	"gahnmasye"	/gaʰnmasye/	[gʱə̀ʱnmə̀s̽ɛ̀]	'long handled wooden mallet'
13.	"tshiqbalu"	/cʰíbalu/	[tsʰíbə̄lū]	'wart'
14.	"gahqrdzawE"	/gáʰrjawẽ/	[gʱə̽ʱr̽dzə̄wǣ]	'man who lives in his wife's house'
15.	"aneqro"	/anéro/	[ə̄ṋɛ́r̽ō]	'darkness'
16.	"dahdzuqra"	/daʰjúra/	[ḓʱə̀ʱdzūr̽ə̄]	'bamboo frame in roof of shed'
17.	"tshatureq"	/cʰaturé/	[tsʰə̄ṭ̭ūr̽ɛ́]	'adolescent'
18.	(not observed)			

Tamang

The major characteristics of lexical pitch may be described for Tamang in terms of two contrastive components, voice quality (tense-lax) and pitch contour. The domain of contrastive pitch is the morpheme or a stem morpheme followed by non-tonal suffixes. The tense (clear)--lax (breathy) contrast is limited to morpheme-initial syllables. The contrastive pitch contour may be thought of as stretching over the one to three syllables that comprise the morpheme. The following examples are given in text orthography except that indications of pitch and crescendo/decrescendo are given by means of lines drawn above the word rather than with "q", "g" and "'" as in the Tamang Phonemic Synopsis.

Monosyllabic patterns:

	tense		lax	
falling	kaa	'blood'	bluh	'seed'
basically level or rising	ru	'horn'	jah	'son

Disyllabic patterns:

	tense		lax	
falling	kola	'child'	dohngpa	'tree'
basically level or rising	yungpa	'stone'	bohkta	'old'

Trisyllabic patterns:

	tense		lax	
falling	lapita	'Nepali shirt'	dohngkale	'a big ape'
basically level or	Tokoro	'a garment'	dahnsiri	'shrew'

For pitch patterns manifested by structures of the form stem + non-tonal affix(es), see Hari, et. al. 'Tamang Tone and Higher Levels' elsewhere in this report.

Thakali

The major characteristics of lexical pitch may be described for Thakali in terms of two contrastive components, voice quality (tense-lax) and pitch contour. As with Tamang, the domain of contrastive pitch is the morpheme followed optionally by non-tonal affixes. The tense (clear)--lax (breathy) contrast is limited to morpheme-initial syllables. The description of contours in Thakali is somewhat different from that in Tamang. For a comparison of the two see the final section of Hari, et. al. 'Tamang Tone and Higher Levels.'

Monosyllabic patterns:

	tense		lax	
contour	ṭo	'to roast'	ru^h	'to stir'
level	nã	'to carry'	tsu^h	'to cook'

Disyllabic patterns:

	tense		lax	
contour	ṭowɔ	'roasting'	ru^{h}wɔ	'stirring'
level	nãwɔ	'carrying'	tsu^{h}wɔ	'cooking'

Trisyllabic patterns:

	tense		lax	
contour	ṭowɔři	'in order to roast'	ru^{h}wɔři	'in order to stir'
level	nãwɔři	'in order to carry'	tsu^{h}wɔři	'in order to cook'

Chepang

The major characteristics of pitch and intensity may be accounted for in Chepang in terms of voiced vs. voiceless syllable-final consonants. In general voiceless consonants in syllable-final position raise the relative pitch of the syllable and increase its relative intensity. Voiced stops lower relative pitch and reduce its relative intensity. The glottal stop /ʔ/ patterns as a voiceless consonant in this respect but in some instances it disappears optionally, leaving an open syllable from the point of view of segmental phonetics, but with the pitch and intensity characteristics of a syllable closed by a voiceless consonant. Chepang may thus be viewed as an incipient tone language. These characteristics of incipient tone are here viewed as a variant manifestation of the glottal stop. For a fuller discussion with examples see Caughley, 'Pitch, Intensity, and Higher Levels in Chepang' elsewhere in this report.

Newari

Newari appears not to have contrastive lexical pitch in any form, and there is little evidence available to us to indicate that it ever was a language with contrastive lexical pitch in the sense used here for other languages of this report. P. Poucha in 'Die Vorsilben und Töne im Tibetishen, das Tangutische, das Newarische und das Baltische' Wissenschaftliche Zeitschrift der Karl-Marx Universität Leipzig, 16:215 (1967) follows R. Shafer 'Newari and Sino Tibetan' Studia Linguistica 6:103 (Lund, 1952) in indicating the following kinds of historical relationship between Newari and certain other Tibetan dialects. Where certain other dialects became tonal with the loss of prefixes, Newari in some instances preserved other reflexes of these prefixes. The Newari nasal aspirates /nh/, /mh/ are thought to descend in some cases from the sequences 'rn', 'sn', 'rm', and 'sm'. Stop and nasal prefixes survive in Newari only where a stem-initial 'l' or 'r' was lost, bringing the prefix consonant in direct contact with the stem vowel. If this is correct, we may conclude that where other languages described here have contrastive lexical pitch or tense-lax register as contemporary reflexes of prefixes lost at an earlier period, Newari has segmental reflexes of these and never developed contrastive lexical pitch or contrastive tense-lax register. Interesting in this connection is the synchronic fact that Newari does have phonetic breathiness following voiced aspirates. For vowels following /mh/ and /nh/, then, this breathiness may in some instances be a phonetic consequence of a reflex of the old Tibetan prefix 's-'. In this respect it is interesting to note that where Tibetan 's-' may correspond to a lax aspirate nasal in Newari "nhay:" 'nose', it at the same time corresponds to the tense syllables in Tamang "na" 'nose', and Thakali "na", 'nose'. If this is correct, then, the Tibetan 's-' has consequences in Newari which are phonetically opposite to the reflexes which it has in Tamang and Thakali.

Sunwar

The analysis of tone presented in Bieri and Schulze, 'Sunwar Tone and Higher Levels' elsewhere in this report was highly tentative. In that analysis lexical pitch in Sunwar is accounted for in terms of two components: pitch (high vs. low) and contour (level vs. falling). Work in progress now indicates that a falling pitch is conditioned by a closed syllable and that laryngealization and nasalization pattern as syllable-final consonants. Bieri and Schulze currently have access to a better informant, and they find now that previous informants had often omitted laryngealization from syllables, making it impossible to predict pitch contour. Syllable pitch contour that was difficult if not impossible to hear on short syllables is now clearly heard. If this hypothesis hold up under further testing .Sunwar may be described in terms of a two-way contrast between high and low. The following examples illustrate the most recent hypothesis regarding Sunwar tone.

High		Low	
kutsa	'come up'	tsutsa	'thresh'
šo:tsa	'tell'	ru:tsa	'have enough'
tuptsa	'beat'	duptsa	'burn oneself'
pu·?tsa	'to weigh'	ru·?tsa	'bind'

Sherpa

The major characteristics of lexical pitch in Sherpa may be characterized in terms of two contrastive components, pitch (high vs. low) and 'intonation' (initial vs. final stress). (It should be noted here that Gordon's use of the term 'intonation' differs from that of Sprigg in that for Gordon 'intonation' is a contrastive component of a foot pitch pattern rather than a variant pitch pattern possibly conditioned by position within the sentence.) Intonation may also be thought of as an intensity contour by comparison with pitch contours of Gurung and Thakali, the pitch contours with secondary intensity contours (crescendo vs. decrescendo) of Tamang, and the pitch-intensity contours of Chepang. The domain of stress and pitch in Sherpa is the phonological foot, a unit ranging in length from one to three syllables. The following are examples of pitch and intonation within the disyllabic foot.

	High (Tone 1)	Low (Tone 2)
Final (Intonation 1)	ki'ki 'by the dog'	te'ki 'by the mule'
Initial (Intonation 2)	'teki 'by the horse'	'diki 'by him (proximal)'

FOOTNOTES

[1] The term 'Bodic' is taken from Shafer (1955). This work was supported in part by the Department of Health, Education and Welfare, Office of Education, Washington, D.C. under contract number OEC-0-9-097721-2778.

[2] The 1961 Census of Nepal, Table 8.

[3] Dor Bahadur Bista, People of Nepal, Department of Publicity, Ministry of Information and Broadcasting, His Majesty's Government of Nepal, 1967, p. 136.

TONE

34-36

THE ROLE OF NUCLEI OF FEET IN THE ANALYSIS OF TONE IN TIBETO-BURMAN LANGUAGES OF NEPAL*

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In Nepal this past summer (1969) I was working with members of the Summer Institute of Linguistics on some seven Tibeto-Burman languages. There was a wide range of variability in their dynamics and in their pitch structures.

In Newari (studied by Austin Hale) no tone (lexical pitch) has thus far been discovered. But there is a very elaborate intonation pattern (phrasal pitch) so elaborate that its description is just begun. In Gurung, on the other hand, Warren Glover finds two phonemic lexical pitch levels. In Tamang, related fairly closely to Gurung, the analysis (by Doreen Taylor with Pike and Hale) requires three pitch levels. In the case of Sherpa, Kent Gordon (building on work of Luke Zylstra) began with a high and a low tone, added a third--plus constrastive stress--but expects, now, that his final analysis will contain only two of the tone levels. This is a report on the early stages of some of these analyses, however, and subject to radical revision by the respective investigators.

In the Gurung there were several components to be integrated: There was a contrastive high and a low pitch; but the high contrastive pitch (apart from the possibility of compounds, perhaps) seems to be restricted to only one syllable of any one phonological word (or 'foot'). The phonological words, which are largely but not exclusively lexical: Some of them are close-knit phrases, or word-plus enclitic. Similarly,there was a contrast between breathy and non-breathy vowels (written here as - for example- /a/ versus /a^h/). These vowels appeared to be restricted to the beginning syllable of the phonological word[1] (apart, perhaps, from a few conditioned exceptions, e.g., in compounds).

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* Reprinted from PROSODIC FEATURE ANALYSIS/ANALYSE DES FAITS PROSODIQUES, P.R. Léon, G. Faure and A. Rigault, eds., Didier, Montréal-Paris-Bruxelles, Studia Phonetica III, 1970.

There was, however, a complication in the Gurung tone analysis since three phonetic levels could clearly be heard,[2] manifesting the two phonemic ones. I would first like to show, then, how Glover dealt with three etic but only two emic levels. He first showed emic pitch intersecting in the system with breathiness. This gave four phonemic types of syllables as can be seen in Fig. 1.

[1] Incidentally, this makes Gurung and related languages very interesting for study by a ' prosodic' approach, related to that of Firth. I cannot imagine any place in the world where it is more apposite. Fortunately, some of the prosodists have been working at it. See J. Burton-Page, in Two Studies in Gurungkura: I. Tone; II. Rhotacization and Retroflexion, BSOAS, Univ. of London, Vol. 17, Part I, 1955, pp. 111-19.

[2] This was observable not only from our theoretical point of view, but also from the viewpoint of Burton-Page who worked on a related dialect.

	Clear	Breathy
Phonemic High	1 /$\acute{v}$/	2 /$\acute{v}^h$/
Phonemic Low	3 /$\grave{v}$/	4 /$\grave{v}^h$/

Fig. 1

Structurally Contrastive Gurung Syllable Types at the Beginning of the Phonological Word (after Glover)

But phonetically the cells were not arranged in that way. Radical pitch conditioning by the breathiness modified the phonetic system into: high, mid, and low pitches versus the clear and breathy vowel qualities, as in Fig. 2.

	Clear	Breathy
Phonetic High	1 [$\acute{v}$]	
Phonetic Mid	2 [$\bar{v}$]	3 [$\bar{v}^h$]
Phonetic Low		4 [$\grave{v}^h$]

Fig. 2

Elements from Fig. 1 are Shown with Phonetic rather than Phonemic Pitch, Illustrating Conditioning by Breathiness

Illustrations of these Gurung contrasts can be seen within the phrasal frame tsú ... yà 'This is ...'. To my perception (not yet tested by instruments) illustrations

(2) and (3) are on the same or approximately same phonetic pitch.

(1) /tsú kyú yà/	'This is water'
(2) /tsú kù yà/	'This is [someone's] chest'
(3) /tsú kyú^{h} yà/	'This is [a] sheep'
(4) /tsú tùh yà/	'This is [a] bucket' [in which the difference of initial k- or initial t- is not relevant to the discussion]

In Gurung the first syllable of a phonological word seems to be marked by an initial stress (in addition to the contrastive potentials for pitch and breathiness). This stress serves to help divide a phonological phrase into phonological words (or 'feet'). (Glover has tested our early hypothesis that stress may be contrastive throughout the word, but has now rejected this hypothesis.)

If some such pattern as that for Gurung proves to have been an early one in the history of some branch of these languages, it would not be surprising to find that the two-phonemic-but-three-phonetic tones developed, in a later stage,[3] of certain of these languages, to three phonemic levels.

In Tamang, as suggested above, three levels of phonemic tone--not just phonetic levels--are in fact found. More extensive documentation will be presented elsewhere, but preliminary--non-minimal--illustrations can be seen in the following set of noun phrases. (Voiced and voiceless consonants affect the pitch, but do not eliminate the three-way contrast.)

(1) 'lé gi 'one tongue'

(2) 'dāp gi 'one needle'

(3) 'bàr gi 'one blanket'

None of these words has a breathy vowel in it, so the pitch differences cannot be attributed to that.

On the other hand, there is a fourth set of nouns which differ from these three. A sample:

(4) sa 'gi 'one tooth' [Total dynamics of word is easily seen to be constrastive.]

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[3] Extensive vocabularies are now being collected in these languages. Some preliminary comparative work is being undertaken by Richard Pittman. Vocabularies, Swadesh-type lexico-statistical comparison, extensive text collections, phonemic summaries, and discussion of tone problems in the phonological word, are being prepared under the direction of Austin Hale for the Summer Institute of Linguistics, partly under Contract No. OEC-0-9-097721-2778(014) for the U.S. Office of Education. The data will be published in the Occasional Papers of the Wolfenden Society on Tibeto-Burman Languages.

Here the noun is unstressed (whereas nouns (1) to (3) were stressed), but the word 'one' picks up a stress. That this is due to its relation to the noun can be seen by comparing 'lé grèn gi 'one big tongue' with sa 'gren gi 'one big tooth' where the added stress falls on the post-noun word, not on the numeral. The pitch of this word gives considerable difficulty in analysis but with the precisely four nominal dynamic patterns, one would feel more at ease with a symmetrical pattern based on high and low, plus some other feature such as glide or intensity. Working together, Taylor, Hale and I tested a two-pitch scheme for nouns in a variety of frames. Our groupings were reasonably constant, and we reached a tentative agreement on the phonetics which was close enough for the next step in analysis. When, however, we tried to describe the morphophonemic replacements of pitch in (short) frames, the rules became so complicated and arbitrary that they looked like nothing known to us in normal language: the kinds of fusion implicit in the rules did not relate to standard processes of assimilation or the like. After some time we left the nouns and turned to the verbs. At that time, I picked up the three contrastive stressed levels of pitch which I have already mentioned, plus the one level where the stress was absent. We then started searching for two more patterns with stresslessness like the fourth, but differing in pitch to fill out the fifth and sixth cells of an implicit matrix of stress-times-pitch. For occasional moments we had hopes for an instance or two, but after a period of time Hale and Taylor found that these tentative contrasts did not stand up to repeated testing, and the skewed system of three pitches in contrast on stress, plus one low unstressed pitch with morphophonemic change to high type (but with induced stress changes in adjacent syllables) was retained.

Meanwhile, however, we compared (for the four sets of verbs) the alternate morphophonemic description starting from two versus three levels respectively. A surprise reached us of a kind I had not experienced before. It was quite possible, in the verb material, to describe the morphophonemics--but the result was extraordinarily complex. Yet when we set up the same phrases in terms of three levels (but four groups) as above, there simply were no pitch morphophonemic problems to handle at all, within the data then in hand! The solution which was 'simpler' from the viewpoint of number of pitch levels was more complicated, irregular, and messy in terms of the language as a whole, than from the viewpoint of the more 'complex' system of three levels.

Another problem: I had heard, since Sapir wrote me a letter years ago (a letter which I quoted in my Tone Languages, p. 9, in 1948), that [at least] the Chinese tones of the Sino-Tibetan group had started without tone. Consequently I was interested to be on the Asiatic mainland for the first time, working and studying tones in a part of the world which I had never touched. I tried to pick up something of the generalized dynamics underlying the structures of that region.

It was quite an experience. For example, we started with two tones in the Chepang - it appeared to be clear that there were two. I could take the material which Ross Caughley had on tape in frames and run it through a test. The three of us, Caughley, his wife, and I, could go through it quickly with no disagreement (excepting very briefly, and then we would reach early agreement). This analysis seemed clear until I started checking the segments of the phonemic system, using material prepared by Caughley throughout, and confirming contrast after contrast, merely inserting a few glottal stops that were absent from Caughley's initial transcription. Yet after a few days, he commented: 'Then there is no phonemic tone here. You have put in glottal stops such that now every non-voiceless word ends in a low pitch.' Consequently, low and high pitches how appeared to be totally conditioned by voiceless consonants or by voiced vowels and consonants.

This was disconcerting to us all but we continued on. We decided to eliminate phonemic tone from our tentative analysis of Chepang, but continued checking the phonetic pitch data further. We ran large sets of words through frames in standard tone technique. In certain frames some of these newly written glottal stops disappeared, but pitch differences remained! Did we now need to re-establish Chepang as a tone language? We worked with it as such, but were unable to find coherent rules for assigning pitch to running text. Our informant left us, and we discontinued pitch study in Chepang, although we had a substantial amount of relevant tape recordings on hand.

I turned to some of the other languages. In addition to the pitch system, we found interesting stress elements, such as I have described above for Tamang. Consequently, I suggested we return to the Chepang tapes. In a crucial instance there we found that when the glottal stop had disappeared and the pitch seemed to be in contrast, the stress situation appeared to be different. If, now, the stress were analyzed as conditioning the replacement of certain glottal stops by (an allophone of) pitch, we ended up a second time without phonemic tone in Chepang.

I had to leave Nepal after a couple of months, but received a letter reporting a further development. It was not the stress that was conditioning the loss of glottal stop, but the consonant following it in the particular frame we had available. This is not too surprising since, in addition to having the phonological word heavily restricted in its distribution of contrastive pitches, and heavily restricted in distribution of contrastive breathiness, we have in the general geographical area heavy restriction as to the types of consonants which begin and end syllables or stress groups (depending on the particular language).

At the moment, therefore, we treat Chepang not as a tone language but as an incipient one. How does tone get started here in Nepal? Our synchronic evidence - subject to correction by careful cognate studies - suggests that it has something to do with a high-level phonological foot, distribution of consonants, and conditioning by loss of consonants or breathiness of vowel.

We have one other kind of information which I thought might be interesting at this point. In the Chepang, when I started to work with it, I asked the informant to whistle (as a standard part of tone technique). In this language, I didn't have to teach him to whistle, since he already had 'whistle-talk' language. In many languages such pitch whistling is helpful, but here everything went wrong. It was astonishing how obviously the whistle pitch differed from the spoken tone: I did not know why, at the time. Finally Caughley suggested that the informant was whistling the consonants along with other material. We had already begun to work on it briefly, and had seen that it was enormously complicated. I never had a chance to hear whistled consonants before. Yet since we now felt that Chepang was not tonal, we could believe more easily that consonants could theoretically be whistled there, and could also see why the whistled pitch need not follow our formerly-assumed tone.

Caughley had prepared the data very systematically. He had taped contrastive isolated pairs [pa] versus [ba],

[pap] versus [bap], etc., by the dozen, or by the hundreds. He had also had the informant whistle each of these pairs on tape. Consequently, we *simply started a phonemic analysis of the whistle exactly as you would start the phonemic analysis of consonants and vowels*.

What did we find? The whistled pitch of [pop] 'lungs' was higher than that for [bop] 'snail'; the initial voiced stop was responsible for the lower pitch (and both may have had a tiny upglide). In [p^{h}op] 'blister', with initial aspiration, the word started with lips closed--as they did also for [pop] and [bop]--but opened more slowly, to make the aspiration clearly audible, The physical process was a bit awkward, however--as I found by experiment myself--and the informant had some difficulty starting out 'cold' with whistling such isolated monosyllables; occasionally he would wet his lips and start over; words in phrases gave him no apparent problem.

Other sounds had sharply audible effects: a postvocalic velar [k] or [ŋ] gave a long fast downglide in the syllable--but an initial [k] an initial upglide. Syllable-final [y] made a very strong rise; [-s] a mild upglide. Vowel qualities also affected the whistle, until the end product for the syllable as a whole became complicated to analyze and to symbolize.

Caughley assigned weights: +1, +2, +3 for relative degrees of pitch movement or steps upwards, and -1, -2, -3, according to the number of steps downward, that a particular consonant (initial or final in a syllable) induced. The vowels also were assigned weights. Having done this, he then added these up in each syllable and predicted the total pitch (relative) height and contour for that syllable. He then tested this prediction for running syllables against his impressionistic pitch transcription of written texts--a heavy demand on his theory. The result: Single predicted and observed contours of isolated words or syllables corresponded fairly well with his theory, but in running text there were numerous departures from his predictions for which as yet he has no explanation. There were also a few special puzzles: Why should [-ʔ] induce a lowering of the whistle, but along with all voiceless stops--a raising of the spoken pitch? Here later collaboration with acousticians is obviously needed.

He is continuing his work on this problem, however, and I have deep hopes that it may ultimately provide a crucial link in the relation between historical change in a language family, and its relation to a starting 'package' of vowel quality, segmental conditioning of pitch, distributional constraints of segments in a phonological word, vowel breathiness and the development of phonemic tone. The whole prospect, in the midst of bewildering detail, is exciting.

A NOTE ON GLIDES, SYLLABICITY AND TONE IN GURUNG

Austin Hale and Warren Glover

The following two generalizations can be maintained for Gurung, almost without exception:

1. There is only one tone per syllable
2. There is only one high tone syllable per word.

Phonetically, however, [áá] (a rearticulated long vowel) and [ə́ɛ́] do occur. They have a pitch pattern quite distinct from [ə́ɛ̀]. Consider, for example, the following.

"saeq"	/saé/	[sə́ɛ́]	'price, thing'
"kabaeq"	/kabaé/	[kə̄bə́ɛ́]	'kapok'
"tshaaqba"	/cʰá:ba/	[tsʰááƀə̄]	'to scrape'
"tsaqe koq"	/câe kó/	[tsə́ɛ̄ kɔ̄]	'his blood'
"ngaqe tsah"	/ŋâe caʰ/	[ŋə́ɛ̄ tsə̀ɦ̂]	'my son'
"saE"	/saẽ/	[sə̄ǣ]	'mind'
"tsaehq"	/caéʰ/	[tsə̀ɦ̂ɛ̄ɦ̂]	'decorative dot on forehead'
"kadhba"	/kaeʰba/	[kə̀ɦ̂ɛ̀ɦ̂ƀə̀]	'to be late'

These examples appear to pose a dilemma. If we interpret [áá] and [ə́ɛ́] as monosyllabic clusters, then [ə́ɛ̀], unless some reason were found to consider it disyllabic in contrast to the other two, would constitute an exception to generalization (1) (one tone per syllable). If, on the other hand, we interpret [áá] and [ə́ɛ́] as disyllabic clusters, they would constitute an exception to generalization (2) (one high tone syllable per word).

In Glover (1969b:27) we find one solution to this dilemma. On this view [áá] and [ə́ɛ́] are taken to be monosyllabic manifestations of the pattern, glide + vowel, and hence segmentally distinct from the disyllabic clusters such as [ə́ɛ̀] and [ùí], which are taken to be manifestations of the pattern, vowel + vowel. This involved setting up a glide phoneme /a̲/ parallel to the glides /y/ and /w/. The glides /w/ and 7y/ do not carry distinctive pitches within the syllable, nor are they syllabic. The sequences [áá] and [ə́ɛ́] were taken to be parallel to sequences such as [wí]. In examples such as

"kwiqba"	/kwíba/	'to lift something heavy'

the first syllable manifests a uniform high pitch similar to that of the problematic [ə́ɛ́] and [áá]. This made the interpretation attractive.

Pike (personal communication, November 21, 1969) expressed uneasiness at this solution inasmuch as it introduced a kind of intersection of syllabic phonemes. Whether a phone [ə] was interpreted as a vowel or as a glide depended upon its pitch, and upon the pitch of the immediately following vowel, if any. Or, circularly, whether [əɛ] and [aa] were interpreted as one syllable or two depended on whether more than one high tone was manifested in the sequence. A phonetic contrast for syllabicity in [ə] is very difficult to establish.

Consideration of the distribution of tone in VV clusters led to a different interpretation of [áá] and [ə́ɛ́]. In a VV cluster (including long vowels as VV clusters for our present purpose) in Gurung there is no contrast between high-high and low-high for any given value of VV. The following chart summarizes the distribution of tone over VV clusters observed

Low Low	àà	èè		àè	àì	àù	ùì
High Low			óò	áè*	áì		úì*
Low High							ùí
High High	áá			áé			

*Occur only across morpheme boundaries.

As noted above, the syllabicity contrast posited between /a̲/ and /a/ in the earlier analysis is obscure, possibly non-existent. Evidence from timing is also inconclusive. The pattern, glide + vowel has a timing impressionistically similar to that of a single vowel, and quite different from that of a VV cluster in which each vowel has a different tone. The timing of a glide + vowel sequence is not, however, very much different from a VV cluster in which both vowels are low tone. Any analysis that accounted for pitch patterns without depending on these elusive differences in syllabicity and timing would be preferred over the earlier analysis, other things being equal.

The distribution of tone over VV clusters given above suggests such an alternative. We note that when /a/ occurs as the first member of a VV cluster, the second member of which has a high tone, /a/ never has been observed to have a low tone. We may thus write the following assimilation rule:

/a/ ---> [ə́] preceding a vowel with high tone

Having done this we may view [áá] and [ə́ɛ́] as disyllabic and still retain both generalizations, though in slightly modified form:

1'. There is only one tone per syllable.
2'. There is only one independent high tone syllable per word.

since /a/ in this environment has no independently contrastive tone. Pike (personal communication, March 11, 1970) prefers to view this as a morphophonemic replacement of low by high. On this interpretation (1') holds for the phonemic data and the word 'independent' would not be needed to account for the morphophonemic representation. Viewing this as sub-phonemic alternation would, of course, introduce partial overlap in the phonemics of tone, but would allow the original set of generalizations to hold for the phonemic representation.

This modification of the original analysis found in Glover (1969b) was adopted too late to incorporate into the text orthography. To incorporate it one need only apply the correction, "a.e" ---> "ae" where ever "a.e" occurs since the only purpose served by "." was to mark the syllabicity contrast which is no longer posited by the current analysis.

GURUNG TONE AND HIGHER LEVELS

Warren W. Glover

[The Gurung tone system may be characterized in terms of two kinds of contrasts, contrasts for pitch-accent, and contrasts for breathiness. The domain for each of these contrasts is the foot, or phonological word, since, with few exceptions, the following generalizations may be made: 1) The initial syllable of a foot is contrastively breathy or clear (with few listed exceptions this contrast is not present elsewhere in the foot) and 2) A foot may have one pitch-accent or none at all. If it has one pitch-accent, the placement of this pitch accent on one syllable or another within the foot is contrastive. A coherent account of Gurung tone must thus include an account of the syllable, the foot, breathiness, and accent, and it is just these sections that we have abstracted from Glover (1969b) for inclusion in this report.]

I. Higher Levels.

A. Syllable.

1. Contrast. The syllables of Gurung may be summarized in the single formula (C$_i$) (M) V (C$_f$), where the nucleus, V, is of uniform vowel quality, nasality, and breathiness. Pitch is also uniform on the nucleus except in the case of the rising glide of accented breathy syllables. The fillers of the slots, listed below under 2. 'Variation', are single phonemes except in the case of "yw" /yw/ filling the M slot in words such as "kywihq" /kywí^h/ 'language', and heterogeneous vowel clusters are hence regarded as disyllabic. "uiqDaa" /u.í.ḍa:/ 'liver'. All of the eight contrastive types generated by the above formula have been observed.

V	"u"	/u/	'cave'
VC$_f$	"oqlmE"	/ól.mẽ/	'uvule'
C$_i$V	"sa"	/sa/	'tooth'
C$_i$VC$_f$	"bid"	/bid/	'speak!'
MV	"li"	/li/	'pole-ladder'
MVC$_f$	"yaahm"	/ya:^{h}m/	'he goes'
C$_i$MV	"pyaah"	/pya:^{h}/	'feather'
C$_i$MVC$_f$	"grihqn"	/grí^{h}n/	'alone'

2. Variation. Variants of the above syllable types are obtained when the syllable slots of a particular type have different segmental fillers, as listed:

C_i	/p, p^h, b, m, t, t^h, d, n, ṭ, ṭ^h, ḍ, c, c^h, j, s, k, k^h, g, ŋ/
M	/r, l, y, w, yw/
V	/i, e, a, o, u/ (either simple or rearticulated, clear or breathy, oral or nasal, and accented or unaccented)
C_f	/l, r, m, n, ŋ, d, b, s, p, t/

Co-occurrence restrictions:

C_f. Closed syllables are relatively rare in the language except for verbal inflection, which manifests all the fillers of C_f except /r, ŋ /.

"yuql tuhm"	/yúl tu^{h}m/	[yúl ṱù^{ɦ}m]	'must come'
"pIn"	/pĩn/	[p^{y}ĩṋ]	'give!'
"roqd"	/ród/	[řɔ́ḓ]	'lie down!'

"yaahb u; ahyaahb dza?" [ỳ^{ɦ}ə^{ɦ}ə^{ɦ}b ū ə^{ɦ}ỳ^{ɦ}ə^{ɦ}ə^{ɦ}b dzə̄]

/ya:^{h}b u a^{h}ya:^{h}b ja/ 'are you going or not?'

There is therefore no restriction of co-occurrence evident between these fillers of C_f and the preceding slots except that /d/ never follows a nasalized vowel and, in verbs, /n/ always follows a nasalized vowel. Elsewhere /n/ follows an oral vowel.

"grihqn"	/grí^{h}n/	[gřĩ^{ɦ}ṋ]	'alone'

There are very few examples of /ŋ/ syllable final, and none with it word final.

"pinggya"	/piŋgya/	[p^{y}ĩŋgyə̄]	'green'
"kanggaq"	/kaŋgá/	[kəŋgə́]	'rice fragments'
"Angngiq"	/ãŋŋí/	[ə̄ŋ:í]	'aunt'

/r/ occurs widely word final as a locative suffix and there is no restriction apparent.

"kyar"	/kyar/	[kyə̄ř]	'there'
"tsuqr"	/cúr/	[tsúř]	'here'
"dIhqr"	/dǐʰr/	[ḓɦǐɦř]	'in the house'

/s/ occurs syllable-final in the single example

"asnaq"	/asná/	[ə̄sṋə́]	'bottom of container'

and /p/ and /t/ occur syllable finally only as geminate stops in loan words such as

"Dyaahqppa"	/ḍyá:ʰppa/	[ḍɦỳɦəɦə̄ɦp:ə̄]	'mechanism'
"satteq"	/satté/	[sə̄ṱ:ɛ́]	'ancient'

C_i with V.

a) Aspirated voiceless stops do not occur before breathy vowels in the initial syllable.

b) Voiced stops do not occur in initial syllable with clear accented vowels, marked "q", nor with breathy unaccented vowels, marked "h", unless the second syllable bears an accent.

"dahdzuqra"	/daʰjúra/	[d͓ɦəɦdzūřə]	'cane frames in roof of shed'

M with V.

a) /r, l/ show no restrictions with vowels.

b) /y/ occurs before front vowels, /i, e/, only after alveolars.

c) /w/ occurs before /i/ most frequently, /e/ less frequently, before /a/ in only a few cases, and not at all (phonemically) before back vowels, /o, u/.

d) /yw/ has been observed before /e/ in only one word (see 93. below) and in all other cases before /i/, never before /a, o, u/.

$\underline{C_i \text{ with M}}$. Syllable prenuclear clusters have been observed as indicated in the following chart and examples. In general it leads to the following conclusions on clustering potential:

a) Interdentals do not cluster at all.

b) Bilabials cluster with any medial except /yw/.

c) Retroflexes may cluster with /y/ or /w/ but examples are very sparse.

d) Alveolars may cluster with all medials except /r, l/.

e) Velars may cluster with all medials, but examples have been observed of only /k/ with /l/, and only /k/ and /n/ with /yw/.

	/r/	/l/	/y/	/w/	/yw/
/p/	1	21	41	61	-
/p^h/	2	22	42	62	-
/b/	3*	23*	43	-	-
/m/	4	24	44	64	-
/t/	-	-	-	-	-
/t^h/	-	-	-	-	-
/d/	-	-	-	-	-
/n/	-	-	-	-	-
/ṭ/	-	-	-	69	-
/ṭ^h/	-	-	-	-	-
/ḍ/	-	-	51	-	-
/c/	-	-	52	72	92
/c^h/	-	-	53	73	93
/j/	-	-	54	-	-
/s/	-	-	55	75	95

	/r/	/l/	/y/	/w/	/yw/
/k/	16	36	56	76	96
/kʰ/	17	-	57	77	-
/g/	18	-	58	-	-
/η/	19**	-	59	79	99

* observed only syllable-initially within words, not word-initially.

** observed only in a word D attributes to a western dialect, not in his own.

1.	"prahq"	/práʰ/	[pr̽ə̽ʱ]	'hundred'
2.	"phrE"	/pʰrẽ/	[pʰr̠̽æ̃̄]	'adult man'
3.	"mebroq"	/mebró/	[mʸɛ̄br̽ɔ́]	'ashes'
4.	"mruq"	/mrú/	[mr̽ú]	'cluster'
16.	"kra"	/kra/	[krə̄]	'hair'
17.	"khriba"	/kʰriba/	[kʰr̠̽īƀə̄]	'to sprain'
18.	"grihq"	/gríʰ/	[gr̽ĭʱ]	'one'
19.	"ngri"	/ηri/	[ηr̽ī]	'laughter'
21.	"plah"	/plaʰ/	[plə̀ʱ]	'mind'
22.	"phleba"	/pʰleba/	[pʰɨɛ̄ƀə̄]	'to get lost'
23.	"tible"	/tible/	[ṱīblɛ̄]	'once'
24.	"mlah"	/mlaʰ/	[mlə̀ʱ]	'unhusked rice'
36.	"kIIq"	/klī́/	[ɨ̟ī́]	'snow'
41.	"pyaah"	/pya:ʰ/	[pỳə̀ʱə̀ʱ]	'feather'
42.	"phyoba"	/phyoba/	[pʰyɔ̄ƀə̄]	'to bow down'
43.	"byaa"	/bya:/	[bỳə̀ə̀]	'wedding'
44.	"myaaqba"	/myá:ba/	[mýə́ə́ƀə̄]	'to scour'
51.	"Dyaahqppa"	/ḍyá:ʰppa/	[ḍʱyʱə̀ʱə̄ʱp:ə̄]	'mechanism'

52.	"tsyO"	/cyõ/	[tšɔ̃̄]	'trap'
53.	"tshyoq"	/cʰyó/	[tšʰɔ́]	'let's go'
54.	"dzyu"	/jyu/	[džù]	'life, body'
55.	"syu"	/syu/	[šū]	'sheath'
56.	"kyuq"	/kyú/	[kyú]	'water'
57.	"khyodo"	/kʰyodo/	[kʰyɔ̄ḍ̭ɔ̄]	'domestic animal'
58.	"gyAAhq"	/gyā́:ʰ/	[gʱỳʱə̀ʱə̄ʱ]	'road'
59.	"ngyohba"	/ŋyoʰba/	[ŋ̭yʱɔʱƀə̄]	'to look'
61.	"pwiba"	/pwiba/	[pwīƀə̄]	'to carry on back'
62.	"phwiba"	/pʰwiba/	[pʰwīƀə̄]	'to blow a fire'
64.	"mwihq"	/mwíʰ/	[mwǐʱ]	'rupees'
69.	"Twiba"	/ṭwiba/	[ṭwīƀə̄]	'to want to follow'
72.	"tswiba"	/cwiba/	[tswīƀə̄]	'to pierce'
73.	"tshwiba"	/cʰwiba/	[tsʰwīƀə̄]	'to touch'
75.	"swiba"	/swiba/	[swīƀə̄]	'to comb'
76.	"kwaalabe"	/kwa:laba/	[kwə̄ələ̄ƀə]	'to heat'
77.	"khwiqba"	/kʰwîba/	[kʰwíƀə̄]	'to return the same day'
79.	"ngweqba"	/ŋwéba/	[ŋwɛ́ƀə̄]	'to jump'
92.	"tsywIba"	/cywǐba/	[tšwīƀə̄]	'to tether'
93.	"tshyweba"	/cʰyweba/	[tšʰwɛ̄ƀə̄]	'to sacrifice'
95.	"sywiba"	/sywiba/	[šwīƀə̄]	'to roof'
96.	"kywihq"	/kywíʰ/	[kʸw̥ʱiʱ]	'language'
99.	"ngywiqba"	/ŋywíba/	[ŋʸŵíƀə̄]	'to ask'

3. Distribution. Examples of the various syllable types initial, medial and final in the word have been observed as charted.

Type	Word-initial	Word-medial	Word-final
V	1	11	21
VC_f	2	-	-
C_iV	3	13	23
C_iVC_f	4	14	24
MV	5	15	25
MVC_f	6	-	26
C_iMV	7	17	27
C_iMVC_f	8	-	28

1.	"uwaaba"	/u.wa:.ba/	[ūwə̄əƀə̄]	'to lever out of the way'
2.	"oqlmE"	/ɔ́l.mẽ/	[ɔ́lmʸæ̃̄]	'uvula'
3.	"nagi"	/na.gi/	[n̯̭ə̄gʸī̆]	'dog'
4.	"siqlmandari"	/sil.man.da.ri/	[sílmə̄n̯̭də̄rī̆]	'ear-rings'
5.	"laqyAA"	/lá.yã:/	[lə́yə̃̄ə̃̄]	'moon'
6.	"yaahrba"	/ya:ʰr.ba/	[ỳʱ̂əʱ̂əʱ̂r̽bə̀]	'to bark'
7.	"mrIsyoq"	/mrī̆.syó/	[mɦ̽ī̆̄š̽ɔ́]	'woman'
8.	"myaahrbaq"	/mya:ʰr.bá/	[mỳʱ̂əʱ̂əʱ̂r̽bə̄]	'to stroll'
11.	"uiqDaa"	/u.í.ḍa:/	[ūíḍə̄ə]	'liver'
13.	"aneqro"	/a.né.ro/	[ə̄n̯̭ɛ́r̽ɔ̄]	'darkness'
14.	"siqlmandari"	/sil.man.da.ri/	[sílmə̄n̯̭ḓə̄r̽ī̆]	'ear-rings'
15.	"kwaalaba"	/kwa:.la.ba/	[kwə̄ələ̄ƀə̄]	'to heat'

17.	"ahmrOIngyU"	/a^{h}.mrõ.ī̃.ŋyũ/	[ə̀^{ɦ}mr̽ɔ̃̀ī̀ŋ̭yũ̀]	'has not seen'
21.	"yuqi"	/yú.i/	[yúī]	'came down'
23.	"padiq"	/pa.di/	[pə̄ḓí]	'navel'
24.	"nimur"	/ni.mur/	[ṋīmūr̽]	'stye in the eye'
25.	"laqyAA"	/la.yã:/	[lə́yə̃̄ə̃̄]	'moon'
26.	"ahlad"	/a^{h}.lad/	[ə^{ɦ}ləḓ]	'don't do that!'
27.	"riqmyU"	/ri.myũ/	[r̽ímyū̃]	'shrew'
28.	"ahprihd"	/a^{h}.pri^{h}d/	[ə^{ɦ}pr̽ì^{ɦ}ḓ]	'don't write!'

B. Foot.

1. Contrast. The foot, or word, is defined as a group of syllables with the first syllable bearing a slight stress or prominence and with normally a decrescendo manifested over the whole group. (The decrescendo is not manifested in the case of monosyllabic accented breathy words, marked "hq", for which a crescendo is an inherent property of the tone class and overrides the foot decrescendo.) The last syllable of a foot is usually lengthened.

Contrastive foot types are set up by the number of syllables, ranging from one to four in the data at hand, the presence or absence of breathiness, and by the placement of the accented syllable, if any. These distinctions lead to four types for monosyllabic words, six types for disyllabic words, and eight for trisyllabic words. So far, all but one of the disyllabic types and two of the trisyllabic types have been observed. Four-syllable words are rare and insufficient numbers have come to hand to determine whether the accent may come on any one of the four syllables or only, say, on the first, second, or last. The types generated by the three distinctions (number of syllables, breathiness, placement of accent) are listed below, with those not yet observed placed in parentheses. Further examples are given in II. B. (It will be noted that this list does not allow for types with breathiness beyond the first syllable. Some examples do occur (see II. A. 'Breathiness'), but I have not yet worked out the implications for the descriptive system.)

a) Monosyllables:

Sq	"s0q"	/sṍ/	[sɔ̃́]	'three'
S	"sa"	/sa/	[sə̄]	'tooth; soil'
Shq	"mehq"	/me^{h}/	[m^{y}ɛ̌^{ɦ}]	'cow'
Sh	"mih"	/mi^{h}/	[m^{y}ī̀^{ɦ}]	'person'

b) Disyllables:

SqS	"khaqri"	/k^{h}ári/	[k^{h}ə́řī]	'throat'
SSq	"kaduq"	/kadú/	[kə̄ḓú]	'walnut tree'
SS	"karu"	/karu/	[kə̄řū]	'a barley-like grain'
ShqS	"Dyahqppa"	/ḍyá^{h}ppa/	[ḍ^{ɦ}ỹ̀^{ɦ}ə^{ɦ}p:ə]	'mechanism'
ShSq	"dzahdzaq"	/ja^{h}já/	[dz^{ɦ}ə̀^{ɦ}dzə̄]	'calf, oppspring; small'
ShS	"tsyohg0"	/cyo^{h}gŏ/	[tšɔ̂^{ɦ}gɔ̀̄]	'pantry'

c) Trisyllables:

SqSS	"tshiqbalu"	/c^{h}íbalu/	[ts^{h}íbə̄lū]	'wart'
SSqS	"aneqro"	/anéro/	[ə̄ṋɛ́řɔ̄]	'darkness'
SSSq	"phumaaliq"	/p^{h}uma:lí/	[p^{h}ūmə̄ə̄lí]	'lime'
SSS	"tagara"	/tagara/	[ṱəgə̄řə̄]	'gate-post'
ShqSS	"gahqrdzawE"	/gá^{h}rjawẽ/	[g^{ɦ}ə́řdzə̄wǣ]	'man who lives in his wife's home'
ShSqS	"dzahrAAqgo"	/ja^{h}rá:go/	[dz^{ɦ}ə̀^{ɦ}řə̄ə̄gɔ̭̄]	'large basket'
(ShSSq - not observed)				
ShSS	"gahnmasye"	/ga^{h}nmasye/	[g^{ɦ}ə̀^{ɦ}nmə̀šɛ̀]	'longhanded wooden mallet'

d) Quadrisyllables:

SqSSS	"siqlmandari"	/sîlmandari/	[sílmə̄ṋḓə̄řī]	'ear-rings'

(SSqSS - not observed)

(SSSqS - not observed)

SSSSq	"belaaudiq"	/bela:udí/	[bʸɛ̀ləəȗḓí]	'guava'
SSSS	"kuturuge"	/kuturuge/	[kūtūřūgʸē]	'bracken'

(ShSqSS - not observed)

(ShSSqS - not observed)

(ShSSSq - not observed)

(ShqSSS - not observed)

ShSSS	"kuhrImba.e"	/kuʰrĩmba̲e/	[kùʰřĩ̀mbə̀ɛ̀]	'next year's'

2. Variation. For a description of the manifestations of accent and breathiness see 11.A. below. For examples of variants of the word produced by substituting syllables of different types, see I. A. 3. 'Syllable-Distribution'.

Across syllable boundaries consonant clusters observed fall into the following classes:

a) Voiced stops preceded by homorganic nasal (/j/ is preceded by /m/).

"khUqndari"	/kʰṹndari/	[kʰṹṋḓəřī]	'hole'
"kanggaq"	/kaŋgá/	[kə̄ŋgə́]	'rice fragments'
"kuhrImba.e"	/kuʰrĩmba̲e/	[kùʰřĩ̀mbə̀ɛ̀]	'next year's'
"amdzyO"	/amjyõ/	[ə̄mdžȭ]	'father's youngest brother's wife'

(There is no contrast observable between oral and nasal vowels preceding this cluster.)

b) /r/ preceding voiced stops, except that /rḍ/ has not so far been observed.

"maahrba"	/ma:ʰrba/	[mə̀ʱə̀ʱřbə̀]	'marvel'
"mahrda"	/maʰrda/	[mə̀ʱřḓə̀]	'male'

"khaqrgU"	/kʰárgũ/	[kʰəřgũ̄]	'yoke of oxen'
"gahqrdzawE"	/gáʰrjawẽ/	[gʱə̆ʱřdzə̄wæ̃̄]	'man who lives in his wife's home'

c) Gemination of /ŋ/ and of voiceless stops.

"Angngiq"	/ãŋŋí/	[ə̃̄ŋ̭:í]	'aunt'
"satteq"	/satté/	[sə̄ṱ:έ]	'ancient'
"Dyaahqppa"	/ḍyá:ʰppa/	[ḍʱy̆ʱəʱəʱp:ə̄]	'mechanism'

d) /r, l/ preceding /m/.

"oqlmE"	/ɔ́lmẽ/	[ɔ́lmʸæ̃̄]	'uvula'
"koqrmE"	/kɔ́rmẽ/	[kɔ̭̃řmʸæ̃̄]	'sparrow'

e) The special cases /bj/ and /sn/ (only one example of each has been observed).

"aabdzyO"	/a:bjyõ/	[ə̄ə̄bdžɔ̃̄]	'father's youngest brother'
"asnaq"	/asna/	[ə̄sṋə́]	'bottom of container'

3. Distribution. No restrictions have been observed on the distribution of word types into the phonological phrase.

II. Tone.

A. Breathiness.

The main characteristic of breathy syllables is that the nuclear vowel is articulated with audible friction in the throat as a stronger air stream is forced past the vibrating vocal cords. The throat muscles are more relaxed during the articulation of breathy vowels, and more tense for clear vowels. Henderson's description of register in Cambodian in 'The Main Features of Cambodian Pronunciation', BSOAS 14. 149-74 (1952), p. 151, is very relevant to the feature of breathiness in Gurung:

> 'The Cambodian "registers" differ from tones in that pitch is not the primary relevant feature. The pitch ranges of the two registers may sometimes overlap, though what I shall call the Second Register tends to be accompanied by lower pitch than the First Register.
>
> 'The characteristics of the first register are a "normal" or "head" voice quality, usually accompanied by relatively high pitch.
>
> 'The characteristics of the second register are a deep rather breathy or "sepulchral" voice, pronounced with lowering of the larynx, and frequently accompanied by a certain dilation of the nostrils. Pitch is usually lower than that of the first register in similar contexts.'

In Gurung the breathy//clear contrast has been observed only on the first syllable of a word with the following exceptions:

1) Compounds with "nOh" /nõ^{h}/ 'inside' as the second element.

"dIhqnOhri"	/dĩ́^{h}nõ^{h}ri/	'inside the house'
"sanOhri"	/sanõ^{h}ri/	'under the ground'

2) The negative forms of a number of verbs. The negative prefix "ah-" is breathy, and the stem of the negative form (the second syllable of the inflected form) is breathy

   a) if it is lexically breathy,

"yaahba"	/ya:^{h}ba/	'to go'
"ahyaah"	/a^{h}ya:^{h}/	'not go (past or present tense)

   b) in certain cases where the stem is clear in positive forms. The writer has not yet been able to complete the analysis of this data, but it seems that the cases may be accounted for by setting up a process whereby the prosody of breathiness of the negative prefix extends to the stem if the stem-initial consonant is not phonetically a stop.

"syeqba"	/syéba/	[š̆ɛ́ƀə̄]	'to know'
"ahsyehq"	/aʰsyéʰ/	[əʱš̆ɛ̀ʱ]	'not know' (present tense)
"khAAqba"	/kʰā́:ba/	[kʰə̄́ə̄́bə̄]	'to be able'
"ahkhAAq"	/aʰkʰā́:/	[əʱkʰə̄ə̄]	
or	/aʰkʰā́:ʰ/	[əʱxə̀ʱə̄ʱ]	'not be ɔble'

(The pronunciation with the stop is more frequent in K's speech than that with the fricative.)

"pIba"	/pĭba/	[pʸī̆ƀə̄]	'to give'
"ahpI"	/aʰpĭ/	[əʱpʸì]	'not give (past or present)

3) The words

"ahgIhq"	/aʰgí̆ʰ/	[ə̀ʱgʱyī̆ʱ]	'eldest sister'
"ahgEhq"	/aʰgéʰ/	[ə̀ʱgʱyæ̆̄ʱ]	'eldest brother'
"ahdzyuh"	/aʰjyuʰ/	[ə̀ʱdž̆ʱùʱ]	'mother's younger sister'

(contrast an alternative term with the same gloss

"ahtsyOq"	/aʰcyṓ/	[ə̀ʱtš̆ɔ̄]), and	
"pahnAhga"	/paʰnăʰga/	[pə̀ʱṋə̀ʱgə̀]	'tomorrow'
"pahnAhli"	/paʰnăʰli/	[pə̀ʱṋəʱlì]	'within the next few days'
"pahnAhri"	/paʰnăʰri/	[pə̀ʱṋə̀ʰř̆i]	'tomorrow morning'

(a contraction of "pahnAhga nAAhgari").

With the exception of compounds of clear words with "nOh", such as "sanOhri" above, none of these forms have breathiness at all unless it occurs at least on the first syllable, and it is a useful generalization to treat breathiness as a contrastive feature of the foot, manifested by a breathy vowel in the first syllable (and occasionally in the second syllable) and by a lowering of the pitch of the whole word (see next section, 'Accent').

B. Accent.

1. Contrast. Two emic levels of pitch are manifested in Gurung--high, marked by /´/ and in the text by "q" following the syllable nuclear vowel (and following "h" if the vowel is breathy); and low, left unmarked in the orthographies. Pitch is contrastive on the nuclear vowel of a syllable, as the pitch of contiguous nonsyllabic vocoids is determined by the pitch of the syllable nucleus.

Only one syllable of a foot may have high pitch, phonemically, and so the term 'accent' is borrowed to refer to the high pitch from Pike's report of Bernard Bloch's description of Japanese in *Tone Languages* (1947) p. 14:

> 'One must watch for the possibility of significant pitch contrasts which are limited, for example, to stressed syllable, or to long vowels... Japanese, according to information which I have received from Dr. Bernard Bloch, of the Yale Graduate School, is one of these borderline types. There are two significant pitches--high and low. Each word may have one and only one syllable with a significant high pitch; many words have no such syllable. The significant high-pitched syllable may be called "accented". Other syllables than the accented one may have high or low pitches of a non-significant type; these non-significant pitches are determined by their position in relation to the accented syllable, and never directly affect the meanings of words. In the following samples [´] indicates the high accented syllables.

hí	'fire'	haná	'flower'
hi	'sun'	hana	'nose'
kí	'tree'	hasí	'bridge'
ki	'spirits, wits'	hási	'chopstick'

> 'For a revised, much more detailed, statement of Japanese pitch, accent, and intonation, see Bloch, "Studies in Colloquial Japanese, II: Syntax," *Lang.*, XXII (1946), 200-1, 203-4.'

Examples in Gurung are:

"liq"	/lí/	'face'
"li"	/li/	'pole-ladder'
"mIq"	/mī́/	'eye'
"mI"	/mī/	'name'
"maqgi"	/mági/	'buffalo'
"madiq"	/madí/	'lip'
"nagi"	/nagi/	'dog'
"mahdzaq"	/ma^{h}já/	'banana'
"mahrda"	/ma^{h}rda/	'male'
"prehq"	/pré^h/	'eight'
"preh"	/pre^h/	'stick'
"dIhq"	/dī́^{h}/	'house'
"tih"	/ti^h/	'occasion'
"paqdi"	/pádi/	'a girl's name'
"padiq"	/padí/	'naval'
"tsyihbaq"	/cyi^{h}bá/	'to remember'
"tsyihba"	/cyi^{h}ba/	'to bite'

2. <u>Variation</u>.

a) <u>Major variants</u>. It is convenient to describe the variation of the pitch of accented and unaccented syllables in terms of three levels of pitch, high [´], mid [¯], and low [`]. Syllables have the following pitch variants:

accented "q" /´/:
[ˇ] low-to-mid glide, with a marked crescendo, occurring on a word-initial breathy syllable.

"mehq"	/mé^h/	[m^{y}ɛ̌^{ɦ}]	'cow'
"dIhq"	/dī́^{h}/	[d̂^{ɦ}ī̌^{ɦ}]	'house'

"gahqrdzawE"	/gáʰrjawẽ/	[gʱə̆ʱr̆dzə̄wæ̃̄]	'man who lives in his wife's house'

[¯] mid level, occurring on non-initial syllable when the first syllable is low pitch.

"dzahrAAqgo"	/jaʰrá:go/	[dzʱəʱr̆ə̄ə̄gō̭]	'large basket'
"dahdzuqra"	/daʰjúra/	[ḓʱəʱdzūr̆ə̄]	'bamboo frame in roof of shed'
"maahraq"	/ma:ʰrá/	[mə̀ʱəʱr̆ə̄]	'gold'

[´] high level, occurring in words without any breathy syllable.

"sOq"	/sŏ́/	[sɔ́]	'three'
"maqgi"	/mági/	[mə́gʸī]	'buffalo'
"aliq"	/alí/	[ə̄lí]	'clod of earth'
"aneqro"	/anéro/	[ə̄ṋɛ́r̆ō]	'darkness'
"phumaaliq"	/pʰuma:lí/	[pʰūmə̄ə̄lí]	'lime'
"tshiqbaaDe"	/cʰíba:ḍe/	[tsʰíbə̄ə̄ḍɛ̄]	'lizard'

unaccented (unmarked):

[`] low level, occurring in
- a) initial syllables after word-initial voiced stops,
- b) in breathy syllables,
- c) in all susequent unaccented syllables after phonetic low unless an accented syllable interposes.

"boba"	/boba/	[bɔ̭̀ƀə̀]	'to bring'
"belaaudiq"	/bela:udí/	[bʸɛ̀lə̀ə̀ùḓī]	'guava'
"tuh"	/tuʰ/	[ṱùʱ]	'bucket'
"mahdzaq"	/maʰjá/	[mə̀ʱdzə̄]	'banana'
"sanOhri"	/sanŏʰri/	[sə̄ṋɔ̀ʰr̆ì]	'under the ground'

[¯] mid level, occurring elsewhere.

"tagara"	/tagara/	[ṱə̄gə̄r̽ə̄]	'gate post'
"tshiqbalu"	/cʰíbalu/	[tsʰíbə̄lū]	'wart'
"tshatureq"	/cʰaturé/	[tsʰə̄ṱūr̽ɛ́]	'adolescent'
"baIhqkaTar"	/ba̲íʰkaṭar/	[bɦə̀ɦī̄ɦ̂kə̄tə̄ř]	'pineapple'

In some cases the pitch of an unaccented syllable (clear) following a clear accented syllable seems to fluctuate between high and mid.

The apparent ambiguity arising from the assignment of a mid level allophone to both the accented and the unaccented tone is in fact completely resolved by distribution. Mid occurs for the accented tone only following a breathy syllable (low in pitch) whereas the unaccented syllable is low in this environment. All other instances of mid level pitch are the unaccented tone. In addition, the clear accented syllable, if in first or second position in the word, appears to carry some degree of perceptual stress, accompanied by decrescendo, which reinforces the contrast between accented and unaccented syllables in the same position, as in

"ali"	/ali/	['ə̄lī]	'brother'
"aliq"	/alí/	['əˌlí]	'clod of earth'

and adds a phonetic distinction to the distributional one to distinguish the second and third syllables of

"dahdzuqre"	/daʰjúra/	['ɖɦə̀ɦˌdzūr̽ə]	'cane frames in roof of shed'

as being respectively accented and unaccented.

But this 'stress' is only of secondary degree compared with the (already weak) primary stress which marks the initial syllable of a foot, and is therefore a less reliable phonetic criterion of accent than the pitch distributional criteria above. It is not marked in the transcription except here and in II. C. 'stress'.

b) Minor variants. The three phonetic levels of pitch postulated for the description of accent variants may themselves vary within a range of pitch depending on:

1) position within the word--high pitch is successively lower, and closer to mid, on the second and third syllables.

2) nasal vowels tend to be higher in pitch than oral.

"mI"	/mĩ/	[m^{y}ĩ̄]	'name'
"mi"	/mi/	[m^{y}ī]	'fire; tail'

3) vowels of different qualities tend to exhibit differing pitch, with /i/ high and /o/ low.

"mi"	/mi/	[m^{y}ī]	'fire; tail'
"mu"	/mu/	[mū]	'sky'
"mo"	/mo/	[m ̭̄]	'cane'

However, these variations in pitch are small, and I have not attempted to represent them in transcription of data in this paper. They do not affect the analysis of accent.

c) Effect of intonation. Overriding the pitch characteristics of accent described above is the effect of position in the phonological phrase and its associated intonation contour. In a sentence such as

"tsaqdi, taq Tuhq mrOI." [tsəḓi / ṭ̭əṭu^{ɦ} mř̃õĩ̆]

/cádi, tá ṭú^{h} mrõĩ./ 'He saw six axes.'

there are two phonological phrases, one final, marked by /./, and one nonfinal, marked by /,/. (See Glover (1969b:35). The closing contour of a final P-phrase in a declarative P-sentence is progressively steeply falling over the last several syllables. The two syllables of "mrOI" are therefore uttered on very low pitch and it is impractical to compare words contrasting for pitch by substitution in this position. The inherent low-mid glide of the breathy accented syllable "Tuhq" is transformed in this environment by the falling intonation to a mid level. (Contrast is still maintained with clear unaccented words in this position as the latter manifest a falling pitch due to the intonational effect.)

The closing contour of a nonfinal P-phrase is rising, and in several repetitions of sentences such as the above it was observed that "tsaqdi" in fact was level or even rising instead of downstepping as would be expected from the lexical pitches.

Dr. Austin Hale pointed out an interesting paragraph intonation in the special case where a particular sentence was repeated two or three times at the researcher's request, without interruption. On the repetitions there was a progressive levelling effect, so that the phonetic range of the phonemic pitch contrasts narrowed almost to vanishing point.

d) Morphophonemics of tone. The only tone morphophonemics which have been observed are associated with the suffixes "maE" (plural number on nouns), "ba" (gerund on verbs), and "e" (possessive on nouns). No tone perturbation has been observed across word boundaries. To state the rules succinctly it is convenient to assign numerical symbols to the four monosyllabic tone groups:

clear accented = 1 ("q"); clear unaccented = 2 (unmarked); breathy accented = 3 ("hq"); breathy low = 4 ("h").

Rule 1. 'Whenever a word including the suffixes "maE" "ba" (both of group 2) would produce the tone sequences 2-2-2 or 3-2-2 the suffix assumes an accent (becoming "maEq" or "baq" in group 1) and the group 3 stem is suppressed (so that the stem becomes group 4).'

Thus *2-2-2 ==> 2-1-2 or 2-2-1 (depending on which syllable is the suffix)

*3-2-2 ==> 4-1-2 (no case has yet been observed where the suffix is the third syllable of 3-2-2 sequence, since no disyllabic noun of the pattern 3-2 has been observed.)

"mehq"	/méʰ/	[mʸɛ̌ʱ]	'cow'	(3)
"mehqmaE"	/méʰma̲ẽ/	[mʸɛ̌ʱmə̄æ̿]	'cows'	(3-2)
"mehmaEqdi"	/meʰma̲ẽ́di/	[mʸɛ̀ʱmə̿æ̿ḓī]	'cows'	(agentive) (4-1-2)
"mili"	/mili/	[mʸīlī]	'tear'	(2-2)
"milimaEq"	/milima̲ẽ́/	[mʸīlīmə̄́æ̿́]	'tears'	(2-2-1)

"khaba"	/kʰaba/	[kʰə̄ƀə̄]	'to come' (2-2)
"khabaqe mih"	/kʰabá.e miʰ/	[kʰə̄ƀə́ɛ̄ mʸı̀ɦ̂]	'the coming man' (2-1-2)

Rule 2. 'Whenever "ba" is attached to a group 3 stem it assumes an accent and the stem accent is suppressed.'

"ahtsyihq"	/aʰcyı̂ʰ/	[əɦ̂tš̆ı̀ɦ̂]	'not remember'
"tsyihbaq"	/cyiʰbá/	[tš̆ı̀ɦ̂ƀə̄]	'to remember'
"ahtsyih"	/ahcyiʰ/	[ə̀ɦ̂tš̆ı̀ɦ̂]	'not bite'
"tsyihba"	/cyiʰba/	[tš̆ı̀ɦ̂ƀə̀]	'to bite'

Rule 3. 'Whenever "e" is attached to a noun which has neither an accented syllable nor breathiness, the final stem syllable takes an accent.'

"kolo"	/kolo/	[kɔ̭̄lɔ̄]	'child'
"koloqe AAma"	/kolóe ã:ma/	[kɔ̭̄lɔ́ɛ̄ ə̃̄ə̄mə̄]	'the child's mother'
"nga"	/ηa/	[ηə̄]	'me'
"ngaqe tsah"	/ηáe caʰ/	[ηə́ɛ̄ tsə̀ɦ̂]	'my son'

Note that this rule neutralizes contrast in this environment between certain group 1 and group 2 stems, such as

"tsa"	/ca/	[tsə̄]	'vein' and
"tsaq"	/cá/	[tsə́]	'he'
"tsaqe koq"	/cáe kó/	[tsə́¯ɛkɔ̭̄]	'the vein's blood; his blood'

3. Distribution. Any syllable of a word may bear the accent, or there may be no accented syllable at all. (see examples above). The disyllabic pattern ShqS and the trisyllabic patterns ShSS and ShSSq have not been observed (where S is a syllable). The other two breathy disyllabic patterns, ShS and ShSq, do not appear to contrast in nouns with stops initial, as all breathy disyllabic nouns with voiceless stops initial are of the ShS pattern,

"kohle"	/ko^{h}le/	'rice gruel'
"puhlU"	/pu^{h}lŭ	'insect'

while all breathy disyllabic nouns with voiced stops initial are of the ShSq pattern.

"gyOhsyIq"	/gyŏ^{h}syī́/	'a type of timber'
"buhdzyuq"	/bu^{h}jyŭ/	'grandmother'

However, the patterns contrast in nouns with initial nasals,

"maahraq"	/ma:^{h}rá/	'gold'
"mahrde"	/ma^{h}rda/	'male'

and in verbs with voiceless stops initial.

"tsyihbaq"	/cyi^{h}bá/	'to remember'
"tsyihba"	/cyi^{h}ba/	'to bite'

C. Stress.

Word stress is not phonemic in Gurung--that is, it does not establish contrastive units (except for the presence of secondary stress on the accented syllable if in first or second position in the word, as described above). However the first syllable of a foot regularly carries a slight stress (primary by comparison with the secondary stress on the accented syllable), which serves as a characteristic feature distinguishing the foot, as a level, from the next lower, the syllable, and the next higher, the phonological phrase.

The perception of this stress is difficult because:

1) it is not contrastive between words,
2) it is only moderate in degree (I am indebted to Kent Gordon for pertinent comments on stress in Gurung including his observation that it is perceptually much less prominent than the (phonemic) stress in Sherpa),
3) it is independent of the features of pitch and length which accompnay stress in English. A particular example is

"ali"	/ali/	['ə̄lī]	'younger brother'
"aliq"	/alí/	['ə̄,lí]	'clod of earth'

Because of the high pitch and secondary stress on the accented syllable in "aliq", co-occurring with the (nonphonemic) length on the foot-final syllable, the second syllable sounds prominent to English ears. In fact there is the primary stress on the first syllable and a decrescendo over the foot.

Above the foot level, stress is significant in marking the nucleus of a P-phrase of P-sentence (see Glover (1969b) II. E. 'Punctuation').

SPECTROGRAPHIC CONFIRMATION OF CONTRASTIVE PITCH AND BREATHINESS IN GURUNG

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A spectrographic check of sample tape recordings confirms the phonetic statements of Glover[1] and Pike[2] concerning pitch and breathiness in Gurung. For this study, Glover provided a taped corpus of 104 contrastive utterances illustrating selected phonological features of Gurung. The informant was Ras Kumaari Gurung, a female native speaker about 31 years of age. Pitch contrasts were exemplified by seven pairs of minimally contrasting items in identical frames. The contrastive sentences, in each case, were less than 2.4 seconds long and thus lent themselves nicely to spectrographic analysis using the Kay Electric Sona-Graph (Model 6061-B).

It should be noted that the sound spectrograph, an acoustic instrument, poses certain problems for the investigation of pitch, a human perceptual phenomenon. The information depicted in a spectrogram is not a precise analog of what we hear. In the frequency range of 100-1000 cycles per second, however, it is safe to assume a positive correlation between perceived pitch, expressed in relational judgments of higher or lower, and the acoustic measure of fundamental laryngeal frequency, expressed in cycles per second.[3] A further problem arising in connection with pitch studies based on spectrograms is, as Lehiste and Peterson have pointed out,[4] that the fundamental frequencies of syllabic nuclei are subject to systematic perturbations conditioned by vowel quality and the influence of preceding and following consonants. As we have insufficient data at present to establish acoustic norms for Gurung which would make it possible to allow for non-significant perturbations of fundamental frequency, we are not in a position to comment on the finer phonetic details of Glover's analysis. Working with minimal pairs, however, we can use the spectrograph to corroborate Glover's crucial statement that three etically distinct levels of pitch in Gurung can be resolved into two emic levels.

Figs. 1 and 2 give the clearest illustration from the available corpus of a minimal pitch contrast on non-breathy syllables. These are narrow band spectrograms of the following contrastive utterances (the substitution items have been underlined for clarity):

S1. tsaqdi liq kuq mrOI 'he saw nine faces'
S2. tsaqdi li kuq mrOI 'he saw nine ladders'

(For the sake of simplicity and consistency, all Gurung material is cited in the text orthography, where the symbol "q" represents phonemically high tone on the preceding vowel; low tone is unmarked; and "h" indicates breathiness. For the phonetic values of the other orthographic symbols, see Glover's articles, elsewhere in this volume.)

The displays in Figs. 1 and 2 show a specially expanded frequency scale, which is achieved by setting the scale magnifier device on the Sona-Graph for a range of 16-1700 cps. This gives dramatic definition to the first harmonic (which traces the fundamental frequency) and the next few higher harmonics. Note that the second harmonic provides an exceptionally clear picture of the rise and fall of the informant's voice on successive syllables. The substitution item "liq" in Fig. 1 is clearly on the same general pitch level as the following phonetically high-pitched morpheme "kuq". In Fig. 2, the syllable "li" is considerably lower than the following "kuq". These spectrograms provide visible proof of contrastive pitch in Gurung.

The fundamental frequencies of the syllabic nuclei in S1 and S2 may be assigned the following approximate values (accurate to ±2-3 cps.)[6] by measuring the average fundamental frequency of relatively level-pitched vowels and the beginning and end point values in the case of pronounced glides. Again, the contrastive syllables are underlined.

S1. 350.375 390 385 290-220
S2. 340.360 325 360 290-220

The absolute values of the fundamental frequencies are, of course, irrelevant for linguistic purposes; but the changes in those values, disregarding non-significant variation between frames, show a clear pitch contrast between "liq" and "li". Thus the claim of at least two contrasting tonemes in Gurung is substantiated.

In Figs. 3 and 4, the same frame is used to show a pitch contrast on breathy syllables.

S3. tsaqdi kihq kuq mrOI 'he saw nine thatches'
S4. tsaqdi kih kuq mrOI 'he saw nine of you'

The frequency values of the fundamental for each syllable are:

S3. 300.325 290-305 335 250-190
S4. 310.335 240-280 320 250-190

This evidence supports a two-way pitch contrast on breathy syllables. Note, by the way, the 15 cps. drop in the fundamental frequency of "kuq" in S2 and S4 as compared with the higher values in S1 and S3. One might suggest that "kuq" has been lowered in these cases by conditioned variation due to the effect of the preceding low toneme. It is also evident that the breathy syllables in Figs. 3 and 4 are substantially lower in pitch, in relation to their respective frames, than the non-breathy syllables in Figs. 1 and 2.

If we again discount the absolute pitch variation between frames and focus on the linguistically meaningful relative changes in pitch, an interesting fact emerges. The drop in fundamental frequency between the second and third syllables of S2 and S3 is identical: the substitution items "li" and "kihq" are exactly 35 cps. lower in frequency than the preceding syllable of the frame. This pitch similarity between the low non-breathy syllable and the high breathy syllable holds true also in relation to the following frame item, the high non-breathy "kuq". The rise in pitch between "li" and "kuq" amounts to 35 cps.; the corresponding figure for "kihq" is 30 cps. (computed from the end point of the rising contour).

These acoustic data support Glover's and Pike's auditory analysis of three etic pitch levels in Gurung: high pitch, on high non-breathy syllables; mid pitch, on low non-breathy and high breathy; and low pitch, on low breathy syllables. Since breathy phonation appears automatically to entail lowered pitch, it is obviously justifiable to regard Gurung as a two-emic-tone system. Examination of the spectrographic data for the remaining five

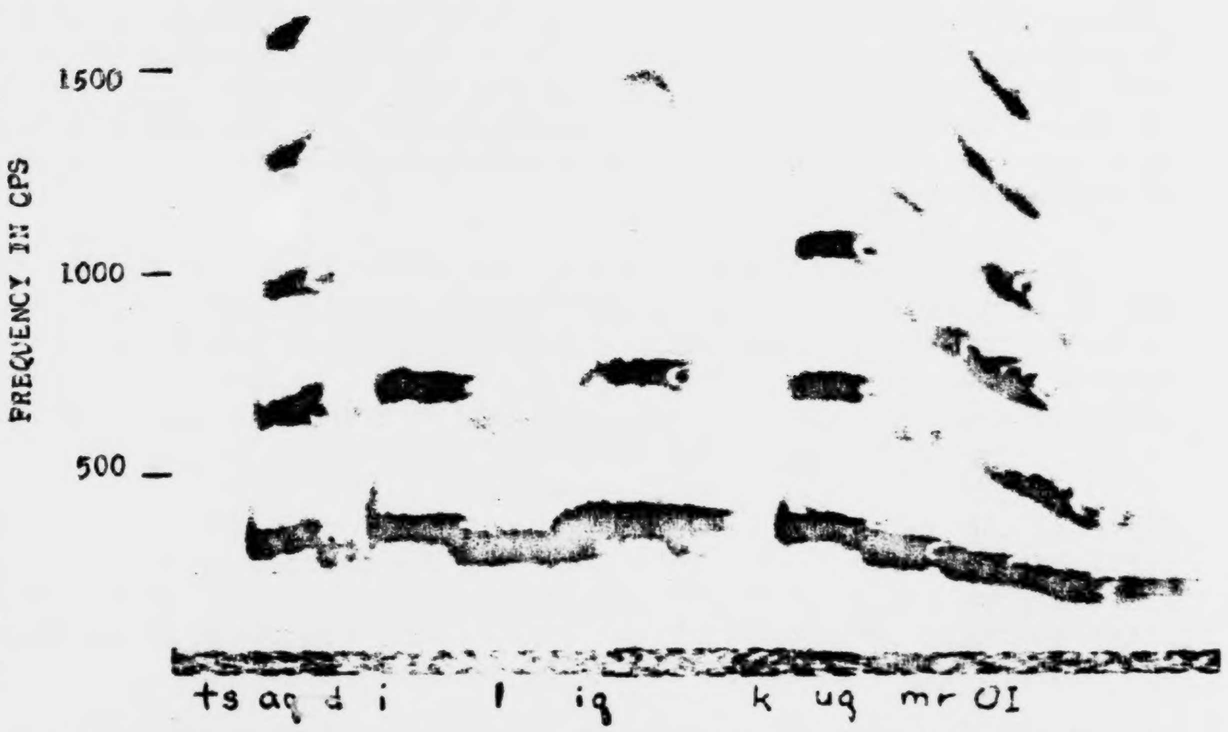

Fig. 1. Narrow band spectrogram of S1. Note that "liq" and "kuq" are on approximately the same frequency level, as one would expect following Glover's analysis.

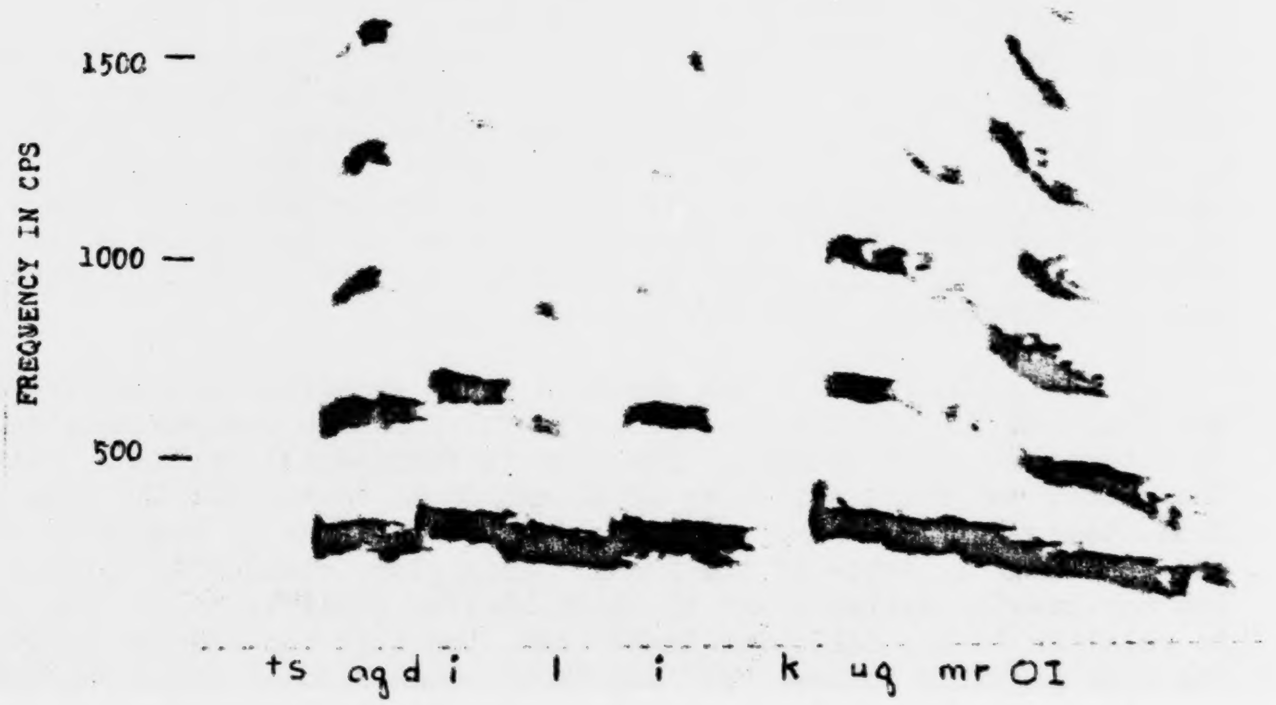

Fig. 2. Narrow band spectrogram of S2. Here the substitution item "li" is lower than the frame item "kuq". Together with the evidence of Fig. 1, this confirms contrastive pitch in Gurung.

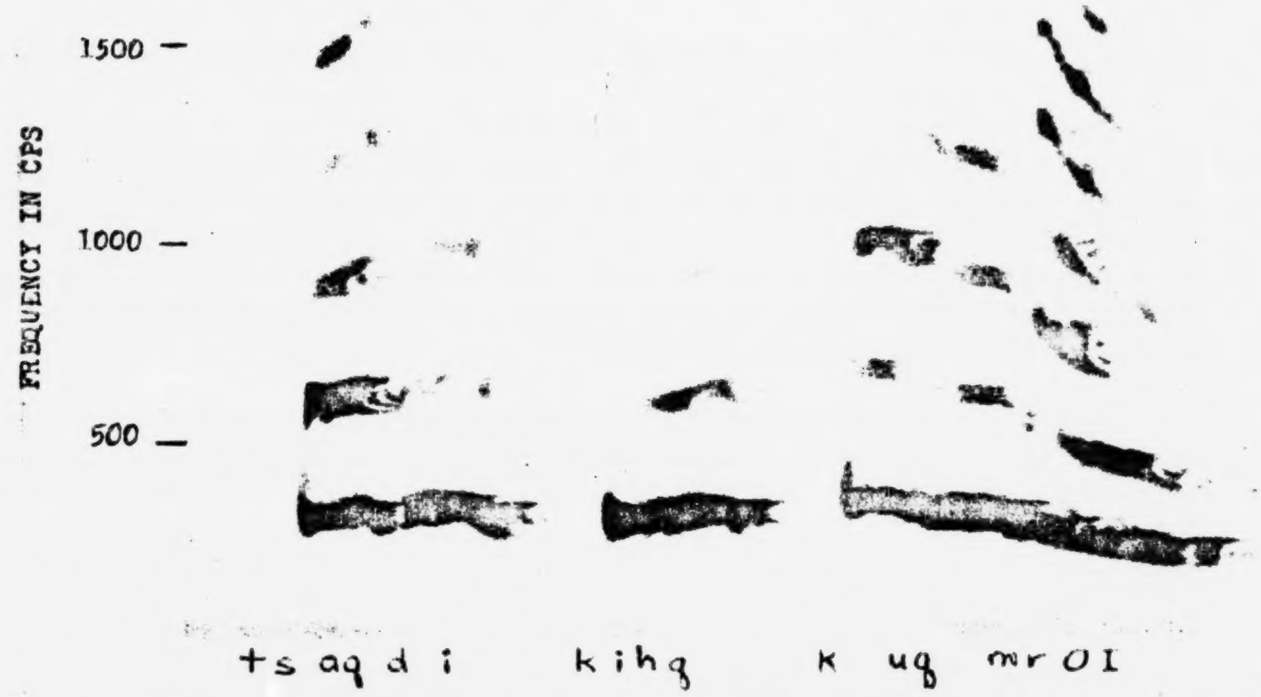

Fig. 3. Narrow band spectrogram of S3. Note that the high breathy "kihq" is lower in pitch than the following high clear syllable.

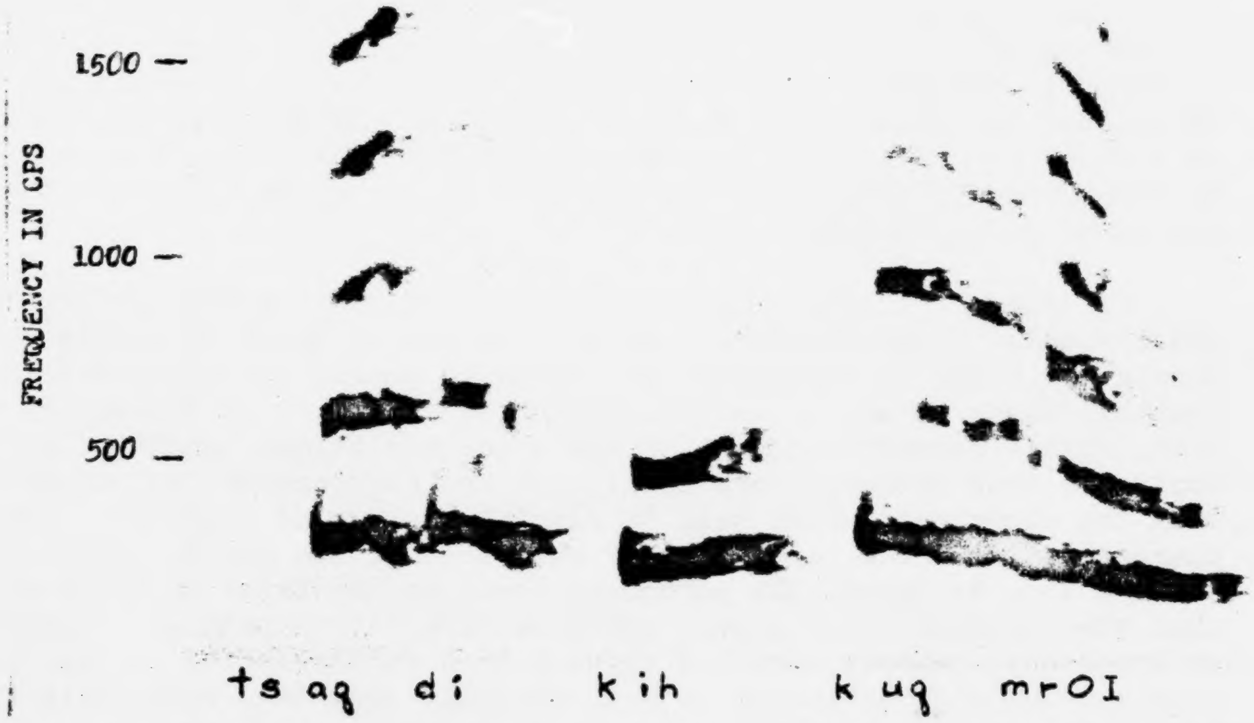

Fig. 4. Narrow band spectrogram of S4, confirming contrastive pitch on breathy syllables.

minimal pairs for pitch provided additional confirmation of this analysis.

The displays in Figs. 1-4 incidentally confirm, in part, the accuracy of Glover's more detailed phonetic observations: for example, that a word-initial breathy syllable with high tone is phonetically a "low-to-mid glide"[7] (note the third syllable in Fig. 3) and that the "closing contour of a non-final P-phrase is rising", with the result that in such a position "tsaqdi" becomes "level or even rising instead of downstepping as would be expected from the lexical pitches."[8]

While the pitch contrasts on breathy and non-breathy syllables were readily confirmed in the laboratory, an attempt to identify the acoustic correlates of breathy vs. clear vowels proved more difficult. This was due in part to the absence of any satisfactory minimal pairs for breathiness in the available data. The only true minimal pair was "mih" 'man'// "mi" 'tail'. The first form, however, was attested only in sentence-final position while the second occurred as an isolated citation form. Other phonetically similar pairs used for analysis were: "kih" 'you'// "ngi" 'we'; "kloh" 'place'// "no" 'lean meat'; "Tuhbaq" 'to sew'// "tuba" 'to close a door'; and "mihq" 'persons'// "mIq" 'eyes'.

Inspection of a variety of wide and narrow band spectrograms of these contrastive pairs did not result in conclusive identification of the acoustic correlates of breathiness. Several acoustic signals seemed to be related to breathy//non-breathy differences in vowels, but it it could not be determined clearly, on the basis of the Gurung material alone, which signal or combination of signals was responsible for breathiness and which should be attributed to extraneous factors such as background noise on the tape, low power on key segments, etc.

In order to obtain more satisfactory contrastive data on breathy vs. clear vowels, Nancy Conklin, a native speaker of American English with special training in phonetics, was asked to record her interpretation of breathy//clear vowels in various contexts, imitating as closely as possible Prof. Pike's demonstrations of these voice qualities. Admittedly, the contrasts thus produced were artificial and exaggerated, but it was hoped that the experiment would help to clarify the Gurung material. Mrs. Conklin's characteristic voice pitch is very near that of the Gurung informant, and we were able to adjust the recording level on her tapes so as to ensure that the breathy//clear vowels would be directly comparable. (Lower volume on a segment, ceteris paribus, results in a fainter trace on the spectrogram; thus a vowel uttered softly is not, strictly speaking, comparable to a louder one.)

Fig. 5 shows Mrs. Conklin's contrast between clear [i] and breathy [i^{h}] . The acoustic power is the same in each case, and a striking difference between clear and breathy vowels readily apparent. For Mrs. Conklin, at least, the major difference between breathy and non-breathy vowels, in this and other cases, shows up acoustically as a blurring of the higher formants of the breathy vowel by [h] -like white noise. The non-breathy vowels, by comparison, exhibit a clear formant structure.

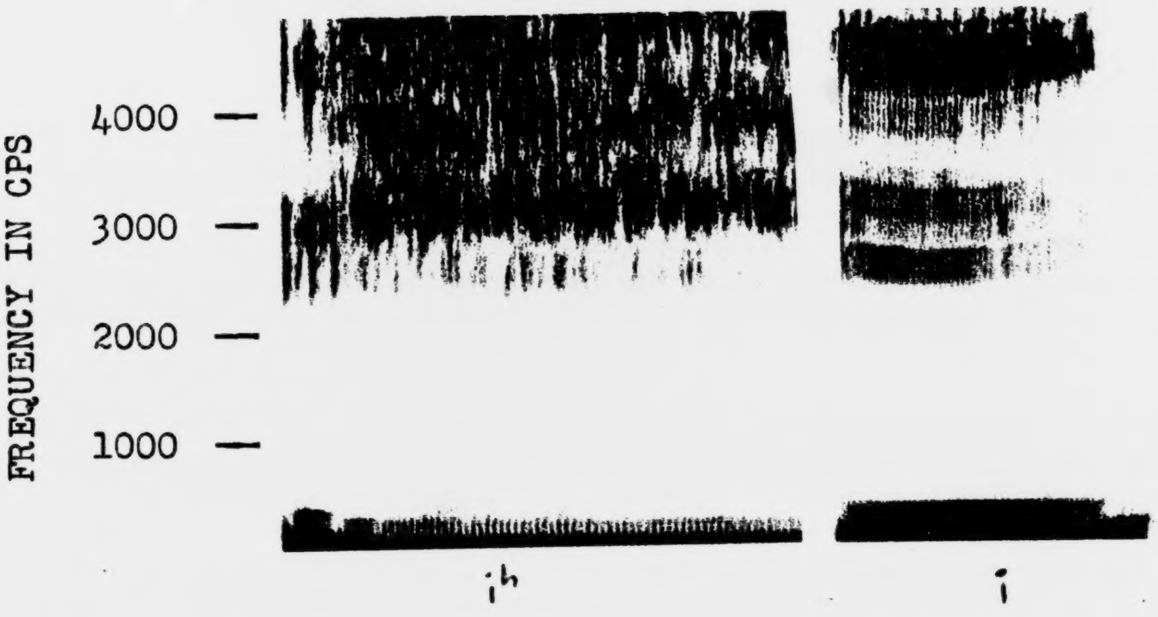

Fig. 5. Broad band spectrogram showing an experimental contrast of breathy//clear vowel quality produced by an American English speaker.

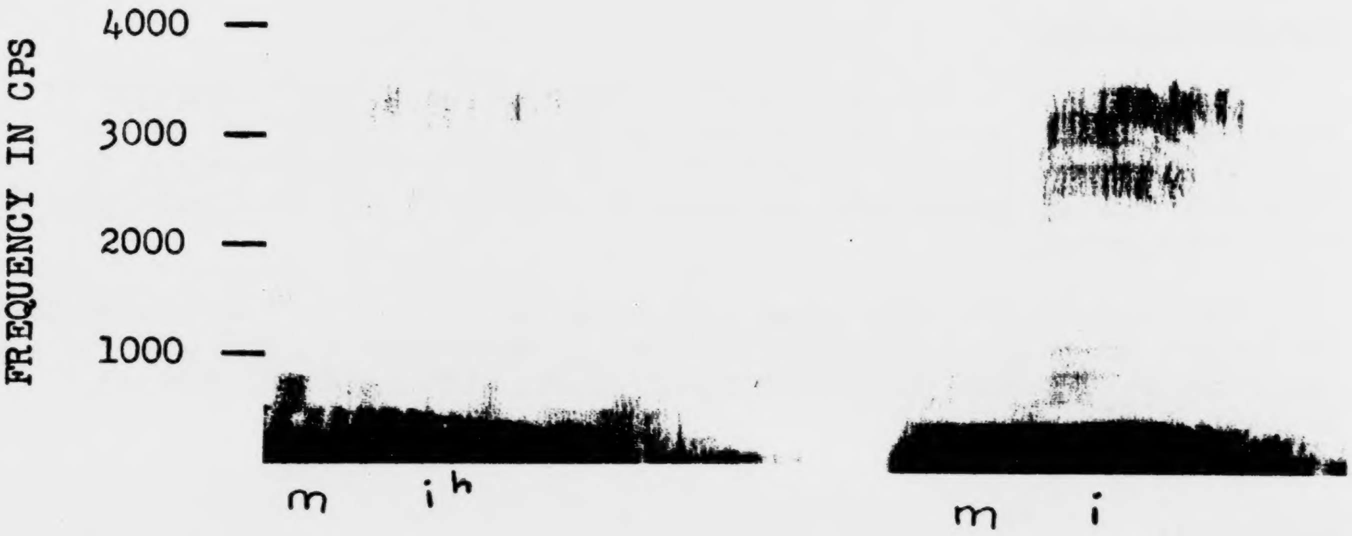

Fig. 6. Broad band spectrogram showing the contrast of breathy//clear vowels recorded by the Gurung informant.

A similar sort of acoustic contrast, although less clear because of lower speech power, can be seen in the Gurung quasi-minimal pairs displayed in Fig. 6. Spectrograms made of other Gurung vowels seem to support this acoustic generalization. Other factors, however (e.g., the attenuation of certain harmonics, possible lowering of formants), may also play a significant role in signalling breathiness. The evidence is, as yet, too tenuous to take a firm stand.

Further investigation of this problem would be highly desirable. There is a genuine question as to whether the breathy//clear contrast involves a special set of the glottis, as Catford[9] and Ladefoged[10] maintain, or whether the crucial distinction is related to the height of the larynx, as appears to be the case in Thakali[11], to tongue-root position, as Pittman suggests[12], or perhaps to a combination of these factors. Acoustic phonetics is uniquely qualified to resolve this issue. If Pittman is right, for example, further spectrographic study of Gurung (and perhaps also Thakali) breathy vowels should reveal the characteristic lowering of the first formant associated with front tongue-root articulation.[13] On the other hand, the quality which Catford and Ladefoged label "breathiness" would be best identified not with the spectrograph, but by means of laryngoscopic and air-flow studies.

Acknowledgements:

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Footnotes:

1. Warren W. Glover, Gurung Phonemic Summary (preliminary, unpublished version). See also his article "Gurung Tone and Higher Levels" (in this volume).
2. Kenneth L. Pike, "The Role of Nuclei of Feet in the Analysis of Tone in Tibeto-Burman Languages of Nepal" (reprinted in this volume).
3. Peter Ladefoged, Elements of Acoustic Phonetics (1962), pp. 75-77.
4. Ilse Lehiste and Gordon E. Peterson, "Some Basic Considerations in the Analysis of Intonation" (The Journal of the Acoustical Society of America, Vol. 33, No. 4: 419-425 (1961)).
5. Pike gives a clear illustration of this relationship in Fig. 2 of the above-mentioned article.
6. These values were derived by measuring the center frequencies of the first four harmonics and estimating their greatest common divisor, which is taken as the fundamental frequency. More precise measurements are possible, but were not deemed necessary in the present instance since the pitch contrasts are clearly revealed in the scale magnified spectrograms.

7. Glover, Gurung Phonemic Summary, p. 55.
8. Ibid., p. 58.
9. J. C. Catford, "Phonation Types", In Honour of Daniel Jones (1964), pp. 26-37.
10. Peter Ladefoged, Linguistic Phonetics (1967), passim.
11. Maria Hari, "Thakali Tone and Higher Levels" (in this volume).
12. Richard S. Pittman, "Gurung, Tamang, Thakali, Sherpa, and Chepang Prosodies" (in Vol. III of this series).
13. Kenneth L. Pike, "Tongue Root Position in Practical Phonetics" (Phonetica 17:129-140 (1967)), p. 138.

TAMANG TONE AND HIGHER LEVELS

Maria Hari, Doreen Taylor, and Kenneth L. Pike

[The Tamang tone system may be characterized in terms of two kinds of contrasts, contrasts for breathiness (tense or clear vs. lax or breathy) and contrasts for pitch contour (basically level vs. falling). The domain for each of these contrasts is the morpheme or the morpheme followed by non-tonal suffixes. The phonetic manifestation of tone is affected by the CVC patterns of the word, by juncture falling at phrase boundaries, and by over-riding sentence intonation. The tone of a morpheme also influences the phonetic manifestation of certain segments. It is therefore necessary to deal with aspects of virtually every level of the phonological hierarchy from segment to sentence in order to give a coherent account of Tamang tone.

Both Pike and Taylor left Kathmandu before the analysis of tone in Western Tamang could be completed. Hale worked further on the analysis for several frustrating months before Hari was invited to help with the analysis. Though the following builds on the work of Pike, Taylor, and Hale, it differs significantly from this previous work and succeeds in accounting for the data in a satisfying manner at many points at which previous approaches had failed. The following account of Tamang tone is Hari's analysis and was written entirely by Hari. This analysis supercedes that given in brief at the beginning of the synopsis of Tamang segmentals. The text and the word lists are given in the orthography which corresponds to this earlier analysis. Both texts and word lists had gone to press before this current analysis was complete.]

I. Levels of the Phonological Hierarchy above the Segments

A. The Syllable Structure

The syllable is the minimum unit of the morpheme and consists of a nucleus filled by a vowel with consonants occurring optionally in pre- and post-nuclear position.

1. Contrast

The following six contrastive syllable-patterns occur:

V VC CV CVC CCV CCVC

V:

"ée"	/é:/	'you'
"ale"	/ale/	'younger brother'
"ípi"	/ípi/	'enemy'

VC:

"ur"	/ur/	'yellow'
"ampale"	/ampale/	'a kind of fruit'
"orpa"	/orpa/	'pull out'

CV:

"sa"	/sa/	'tooth, ground'
"kí"	/kí/	'water'
"ru"	/ru/	'animal's horn'

CVC:

"kang"	/kaŋ/	'foot'
"mahr"	/maʰr/	'gold'
"Tup"	/ṭup/	'thread'

CCV:

"kra"	/kra/	'head'
"gyúuh"	/kyú:ʰ/	'sheep'
"gléh"	/kléʰ/	'clan name'

CCVC:

"mlang"	/mlaŋ/	'black'
"pleng"	/pleŋ/	'big flat stone'
"gréhn"	/kréʰn/	'eldest'

2. Variation

Consonant clustering within the syllable occurs only in the pre-nuclear position. The number of consonants which can occur in the second C-slot is very limited. The following chart expresses the combinatorial possibilities for these syllable initial CC-clusters.

first C	second C	yields:
/p/ /p^h/	/r/	/pr/ /p^hr/ /kr/ /k^hr/ /mr/
/k/ /k^h/	/l/	/pl/ /p^hl/ /kl/ /k^hl/ /ml/
/m/	/y/	/py/ /p^hy/ /ky/ /k^hy/ /my/
/c/ /c^h/	/y/	/cy/ /c^hy/
/s/		/sy/
/ŋ/		/ŋy/
/t/ /t^h/	none	
/ṭ/ /$ṭ^h$/		
/n/		
/l/		
/y/		
/h/		
/r/ /r^h/		
/w/ /w^h/		

CCV:

"plaa-pa"	/pla:-pa/	'slip' (pres)
"pap-phlup"	/pap-p^hlup/	'upside down'

"kli"	/kli/	'feces'
"khlaa-pa"	/k^{h}la:-pa/	'throw away' (pres)
"mlang"	/mlaŋ/	'black'
"kra"	/kra/	'head'
"khrú-pa"	/k^{h}rú-pa/	'wash' (pres)
"próo"	/pró:/	'light meal'
"mráa"	/mrá:/	'weed'
"byóh"	/pyó^h/	'bamboo mat'
"phyáa"	/p^{h}yá:/	'broom'
"kyápa"	/kyápa/	'wooden spoon'
"khya-pa"	/k^{h}ya-pa/	'mend' (pres)
"cyaa-pa"	/cya:-pa/	'see' (pres)
"chyúku"	/c^{h}yúku/	'oil'
"sya"	/sya/	'meat'
"ngyeh"	/ŋye^h/	'milk'

CCVC:

"pleng"	/pleŋ/	'a big flat stone'
"phlik-pa"	/p^{h}lik-pa/	'flash' (pres)
"klang-pa"	/klaŋ-pa/	'play' (pres)
"mlang"	/mlaŋ/	'black'
"prang"	/praŋ/	'stand over fire-place'
"phrengka"	/p^{h}reŋka/	'a necklace'
"kríng-pa"	/kríŋ-pa/	'cry out' (pres)
"khráng-pa"	/k^{h}ráŋ-pa/	'burn' (pres)
"mring"	/mriŋ/	'wife'

"pyang-pa"	/pyaŋ-pa/	'able to run fast'
"phyang-pa"	/p^{h}yaŋ-pa/	'fly' (pres)
"kyung-pa"	/kyuŋ-pa/	'lemon, sour'
"khyang"	/khyaŋ/	'platform'
"jyohr-pa"	/cyo^{h}r-pa/	'wring out' (pres)
"chyong"	/c^{h}yoŋ/	'necklace of precious stones'
"myúr"	/myúr/	'overflow'
"ngyáhng"	/ŋyá^{h}ŋ/	'we'
"syáp-pa"	/syáp-pa/	'catch up with' (pres)

3. Distribution

Note: The trisyllabic morphemes are not included in this statement of distribution because they are quite rare in the language.

Combining the six emic syllable types we get the following 36 possible patterns for the bisyllabic morpheme:

1 CV.CV	/ma.ki/ 'buffalo'	/ci^{h}.ta/ 'small'
CV.CVC	/k^{h}á.pop/ 'heaped'	/pu^{h}.luŋ/ 'bug'
2 CV.V	does not occur within a single morpheme	
CV.VC		
3 CV.CCV	/pe^{h}.sya/ 'insane'	
CV.CCVC	/kú.cyuk/ 'narrow'	/tá^{h}.praŋ/ 'crow'
4 CVC.CV	/kók.ta/ 'crooked'	/pa^{h}l.pa/ 'frog'
CVC.CVC	/hok.toŋ/ 'deep'	/po^{h}l.top/ 'knot'
5 CVC.V	not possible, this block syllabifies like set 1	
CVC.VC		

6	CVC.CCV	/na^{h}m.syo/ 'tomorrow'	/ta^{h}r.cyu/ 'flag'
	CVC.CCVC	/p^{h}it.cyor/ 'outside'	
7	V.CV	/á.ŋa/ 'younger sister'	/a.le/ 'younger brother'
	V.CVC	/í.kok/ 'hiccup'	
8	V.V	does not occur within a single morpheme	
	V.VC		
9	V.CCV	/a.cyo/ 'elder brother'	/ó.ŋye/ 'some time ago'
	V.CCVC	/a.syaŋ/ 'father-in-law'	
10	VC.CV	no example found, non-significant gap, due to the rarity of VC-syllables in general	
	VC.CVC		
11	VC.V	not possible, this block syllabifies like set 7	
	VC.VC		
12	VC.CCV	no example found, non-significant gap	
	VC.CCVC		
13	CCV.CV	/krá.su/ 'steep'	/k^{h}ri.ti/ 'dirty'
	CCV.CVC	/cyá^{h}.taŋ/ 'near'	
14	CCV.V	not possible within a single morpheme	
	CCV.VC		
15	CCV.CCV	/syo.syo/ 'paper'	
	CCV.CCVC	non-significant gap	
16.	CCVC.CV	/kra^{h}m.pa/ 'cheek'	/kliŋ.to/ 'naked'
	CCVC.CVC	/cyot.tor/ 'comb'	

17	CCVC.V	not possible, this block syllabifies like set 13
	CCVC.VC	
18	CCVC.CCV	/ŋyam.ŋya/ 'bird'
	CCVC.CCVC	/prép.prép/ 'together' /cyaŋ.syar/ 'storm'

Out of the 36 patterns six are not possible because they are repetitions of other patterns. See 5, 11, 17.

For five patterns, no examples could be found. (10, 12, 15b) In these cases the gaps seem not very significant.

For the six patterns of 2, 8, and 14 the gaps seem significant. No sequences of two V-syllables occur within a single morpheme. Patterns 2a, 8a, and 14a are possible for the word, because there are suffixes with the syllable shape "-V". Patterns 2b, 8b, and 14b are not possible for the word either because there is no suffix with the shape "-VC".

If a simple statement of CV-patterns must cover both, word and morpheme level, we find, that certain patterns are possible for the word but not for the morpheme (2a, 8a, 14a). On the other hand we would expect the patterns 2b, 8b, and 14b also to be possible for the word, but they actually do not occur simply because there is no affix with the shape "-VC". This gives us a good ground for postulating a phonological morpheme level. Altogether we have several reasons to assume that this level is important. They are the following:

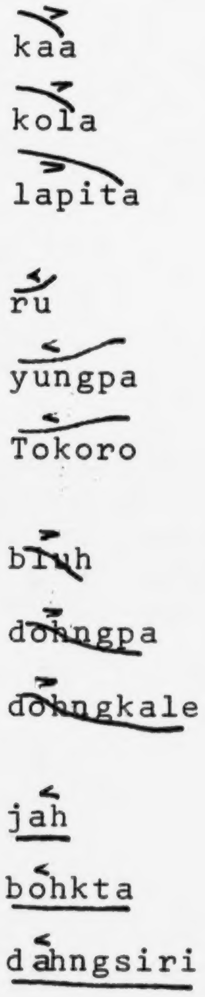
1. The morpheme has a unique set of CV-patterns which is not identical with the word.
2. The morpheme is the basic unit on which the voice-quality and pitch systems operate.
3. The morpheme is also the basic unit for the distribution of certain phonemes: Aspirated stops occur only morpheme initial, never morpheme medial. But they do occur word medial in stem compounds and in words with the negative prefixes "a-" and "tha-".

B. The Morpheme

Note: In the following sections data without brackets or quotes are written in the text orthography, except for the pitch contours, which are symbolized with lines, giving a phonetic approximation of the rises and falls involved.

A morpheme consists of 1 to 3 syllables, and it is the primary domain of tone. That is, the contrastive pitch contours stretch over the 1 to 3 syllables of a morpheme.

Illustrations:



"káa"	kaa	'blood'
"kóla"	kola	'child'
"lápita"	lapita	'Nepali shirt'
"ru"	ru	'horn'
"yungpa"	yungpa	'stone'
"Tokoro"	Tokoro	'a garment'
"blúh"	bluh	'seed'
"dóhngpa"	dohngpa	'tree'
"dóhngkale"	dohngkale	'a big ape'
"jah"	jah	'son'
"bohkta"	bohkta	'old'
"dahngsiri"	dahngsiri	'shrew'

C. The Word

A word consists of at least one morpheme. The stem morpheme can be preceded by one prefix and followed by several suffixes. There are also compound words which contain two stem morphemes. The word is the secondary domain of the contrastive pitch features. With regard to the distribution of the pitch features we may distinguish two types of words: Simple words and compound words.

1. Phonological simple words. They consist of a stem and a string of neutral suffixes. In this case the pitch contour of the stem stretches over the neutral suffixes.

"syóo"	syoo	'beg'
"syóo-ri-pa-la"	syoo-ri-pa-la	'(pres cont)'
"ngoo"	ngoo	'tease'
"ngoo-ri-pa-la"	ngoo-ri-pa-la	'(pres cont)'
"dóoh"	dooh	'return'
"dóoh-ri-pa-la"	dooh-ri-pa-la	'(pres cont)'
"Daah"	Daah	'win'
"Daah-ri-pa-la"	Daah-ri-pa-la	'(pres cont)'

2. Phonological compound words. They consist of more than one stem, or of a stem and suffixes with distinctive tone, or of stems and suffixes with distinctive tone. In compound words, each component keeps its own pitch contour.

Components:

"sung"	sung	'mouth'
"phíi"	phii	'shell, bark'
"míi"	mii	'eye'
"yaa"	yaa	'hand'
"thing"	thing	'floor'
"chám"	cham	'hair'
"mráp"	mrap	'door'
"joh"	joh	'point, end'
"buh"	buh	'body'

"dáhp"	dahp	'needle'
"buhĺung"	buhlung	'bug'

Compound words:

"míi-chám"	mii-cham	'eyebrow'
"míi-phíi	mii-phii	'eyelid'
"mráp-sung"	mrap-sung	'doorway'
"chám-buhlung"	cham-buhlung	'caterpillar'
"sung-phíi"	sung-phii	'lips'
"yaa-thing"	yaa-thing	'hand palm'
"yaa-joh"	yaa-joh	'finger tips'
"buh-chám"	buh-cham	'body hair'
"dahp-joh"	dahp-joh	'point of needle'

Tonal (or distinctive) affixes do not fall under the influence of the stem to which they are affixed, but they manifest their own pitch contours. Phonologically these words are compound words.

Examples with the plural suffix "-maah":

"míi-máah"	mii-maah	'eyes'
"sung-máah"	sung-maah	'mouths'
"dáhp-máah"	dahp-maah	'needles'
"joh-máah"	joh-maah	'points'

Examples with the negative prefixes "á-" and "tha-":

"á-chúm"	a-chum	'(he) didn't hide'
"á-yuu"	a-yuu	'(he) didn't pour'
"á-núuh"	a-nuuh	'(he) didn't sleep'
"á-bluhm"	a-bluhm	'(he) didn't soak'
"tha-ngóm-o"	tha-ngom-o	'don't show'

"tha-hur-o"	tha-hur-o	'don't throw away'
"tha-brah-ko"	tha-brah-ko	'don't walk'
"tha-duhm-o"	tha-duhm-o	'don't spin'

D. The Phonological Phrase

The end of a phonological phrase is characterized by various juncture features. They are manifested by:

--varying degrees of length on the last syllable before the juncture,

--followed by pauses of varying degrees of length,

--the last syllable before larger junctures carries an intonational stress accompanied by upstep and up-glide in pitch.

tila·/ thengi-maah-ce: // bohmpo-maah-ki·/ naka-maah·/

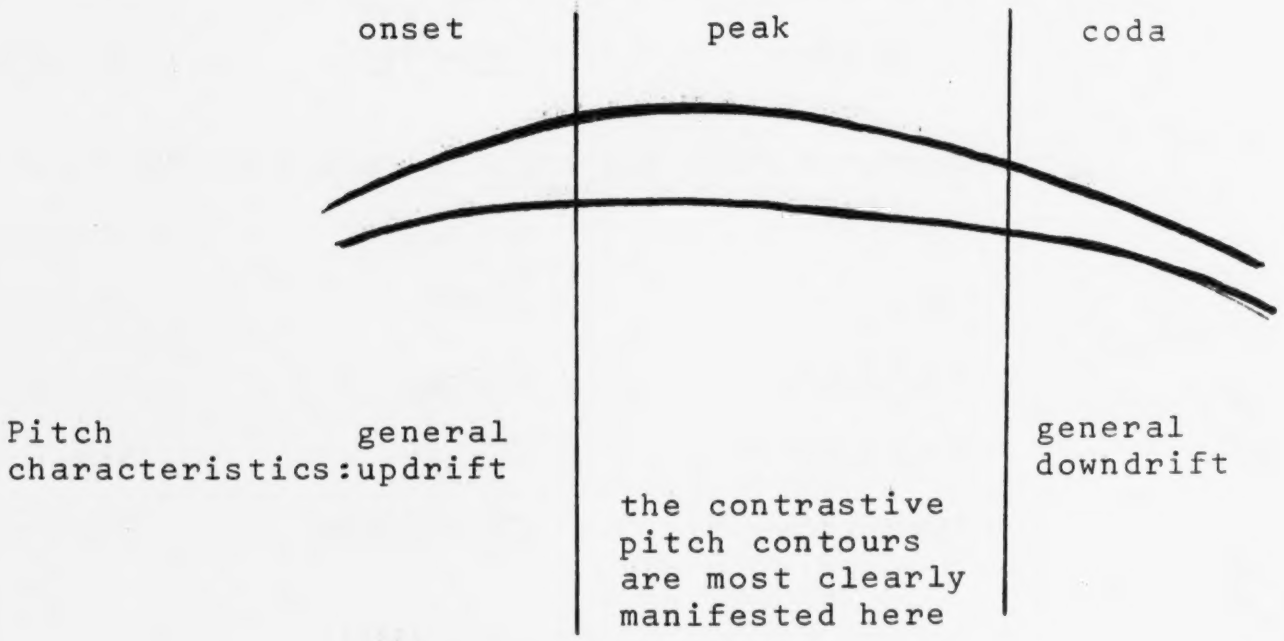
yesterday/ they-pl-A // shaman-pl-of/ hen-pl /

yoh-pa-ri ngi-ci: # 'Yesterday they went to cook the shamans' hens.'

cook-v-v go-v

E. The Phonological Sentence

The pitch dimensions of a phonological sentence can be symbolized by the following shape:


onset
peak
coda
Pitch characteristics: general updrift
the contrastive pitch contours are most clearly manifested here
general downdrift

In the onset and coda the contrastive pitch contours are not wiped out, but they shrink in their dimensions as the representation above attempts to show. All statements about high and low pitch are relative to the point of the phonological sentence at which the pitch in question occurs. A high tone has to be higher than a low tone only at the same point of the phonological sentence, but not necessarily higher than a low at another point in the sentence.

dahngse bohmpo-maah-ce: // ama-ki· / canu-maah cung-pa-ri
(some time ago) shaman-pl-A// mother-of/ wasp-pl sell-v-v

ngi-ci:# 'Some time ago the shamans went to sell mother's wasps.'
go-v

nahmsyo:/ ngyahng-ki roh-maah: // graah-ki·/ jah-maah
tomorrow we-of friend-pl spirit-of son-pl

cung-pa-ri ngi-pa: # 'Tomorrow our friends will go and catch the sons of the spirit.'
catch-v-v go-v

For the tone analysis we have mainly concentrated on listening to the contrasts at the peak of the sentence. The examples given show the contrasts as they are manifested in the peak. Also, the illustrations are not to be listened to in isolation but in frames. For simplification the frames are not given, but the pitch contours are given as they occur in utterances. If the items are pronounced in isolation, overriding intonation factors may change the pitch contour drastically.

II. The Tone System

A. Voice Quality

1. Contrast

In D. Taylor's 'Tamang Segmental Synopsis' elsewhere in this report, a contrast is posited between "clear" and "breathy" vowels. These terms have the advantage of being relatively well-known and of showing systemic parallels between languages of this report. For Tamang, however, these terms may be misleading since the contrast between "clear" and "breathy" is phonetically realized as a contrast between tense and lax articulation. We will therefore refer to this contrast as tense vs. lax in the following discussion.

The voice quality contrast results mainly from a change in the position of the Adam's apple. In the pronunciation of lax vowels, the Adam's apple remains lowered. This results in a larger resonance chamber at the back of the mouth and the vowel sounds relaxed and vibrating. In the pronunciation of tense vowels, the Adam's apple is raised slightly. This results in a smaller resonance chamber at the back of the mouth and the vowel sounds tense and less vibrating.

In addition, the lax articulation has a lowering effect on the pitch of the vowel. Tense articulation on the other hand, conditions high pitch.

The tense/lax voice quality contrast together with its lowering or raising effect on pitch is only relevant on the first syllable of a stem morpheme on the first syllable of a tonal affix.

Minimal contrasts

Laxness is symbolized with "h" after the vowel.

"wáa"	waa	'to feed'
"wáah"	waah	'to hit, thresh'
"wa"	wa	'to dig'
"wáh"	wah	'to measure'
"roo"	roo	'to bear fruit'
"róoh"	rooh	'to fry'
"too"	too	'to need'
"dooh"	dooh 1)	'to reach there'

1) Syllable initial stops before lax vowels are regularly voiced.

"kuu"	kuu	'to wear a hat'
"guuh"	guuh	'to stop'
"pang"	pang	'to fall over'
"bahng"	bahng	'to fight with words'
"tá"	ta	'to knock down fruit'
"dáh"	dah	'to discover'
"ná"	na	'to be ill'
"náh"	nah	'to rest'
"náa"	naa	'to carry'
"naah"	naah	'to persecute'
"pling"	pling	'to fill'
"blihng"	blihng	'to fall'
"pu"	pu	'cooking pot'
"búh"	buh	'field'
"kí"	ki	'water'
"gíh"	gih	'thatch'
"míi"	mii	'eye'
"miih"	miih	'man'

"cang"	cang	'daughter-in-law'
"jahng"	jahng	'to put down words'
"la"	la	'god'
"lah"	lah	'hill'
"líi"	lii	'face'
"liih"	liih	'body'
"me"	me	'fire'
"méh"	meh	'cow'
"Túu"	Tuu	'sweat'
"Dúuh"	Duuh	'six'
"ngíi"	ngii	'we'
"ngíih"	ngiih	'two'
"prang"	prang	'stand over fire place'
"brahng"	brahng	'hut'
"nga"	nga	'I'
"ngáh"	ngah	'five'
"tíngi"	tingi	'today'
"tihngi"	tihngi	'sunshine'

2. Variation of segmentals conditioned by voice quality

a) Voicing of syllable initial stops.

If a lax syllable starts with an unaspirated stop, the stop is voiced. In careful speech it is a full voicing, in less careful speech it may be only a slight voicing, or voiceless lenis pronunciation.

"bohltop"	/po^{h}ltop/	[bo^{h}lṭop/ po^{h}lṭop]	'knot'
"béhngke"	/pé^{h}ŋke/	[be^{h}ŋge/ pe^{h}ŋge]	'small basket'
"daah"	/ta:^{h}/	[da:^{h}/ ṭa:^{h}]	'pole'
"dóh"	/tó^h/	[do^h/ ṭo^h]	'courtyard'
"jihta"	/ci^{h}ta/	[ji^{h}ṭa/ çi^{h}ṭa]	'small'
"jyáhtang"	/cyá^{h}taŋ/	[jya^{h}ṭaŋ/ çya^{h}ṭaŋ]	'nearby'
"Daah-pa"	/ṭa:^{h}pa/	[ḍa:^{h}ba/ ṭa:^{h}pa]	'to win'
"Dáh-pa"	/ṭá^{h}pa/	[ḍa^{h}ba/ ṭa^{h}pa]	'to cross out'
"gruhng"	/kru^{h}ŋ/	[gru^{h}ŋ/ kru^{h}ŋ]	'intestines'
"gláhp"	/klá^{h}p/	[gla^{h}p/ kla^{h}p]	'ox'

Exception in loans

In the speech of the informant some Nepali loan words violate this phonemic rule insofar that we find tense vowels after initial voiced stops:

"báasuli"	/bá:suli/	[ba:suli]	'bamboo flute'
"dắmpuru"	/dắmpuru/	[damburu]	'a drum'
"gúntiri"	/gúntiri/	[gundiri]	'rice straw mat'

b) Onset of word initial vowels.

A glottal stop is the normal onset of tense vowels occurring word initially. Slight voiced aspiration precedes lax vowels occurring word initially. Phonemic status needs not to be attributed to these features.

"ée"	/é:/	[ʔe:]	'you'
"ípi"	/ípi/	[ʔipi]	'enemy'
"ama"	/ama/	[ʔama]	'mother'
"eeh"	/e:^{h}/	[ɦe:^{h}]	'4th year'

3. Distribution

a) The tense/lax contrast is only relevant on the first syllable of stem morphemes and on the first syllable of tonal affixes. On second or third syllables of stems and on neutral affixes this contrast is not operating.

b) Lax vowels do not occur after the aspirated stops and the voiceless /r^{h}/, /w^{h}/ and /h/. After these only tense vowels can occur. It is after unaspirated stops, after /s/, and after voiced consonants and in syllable initial vowels where the tense/lax contrast is operating.

c) All vowels occur tense and lax.

d) Lax vowels have been observed in five of the six emic syllable types.

CV	"Dih"	/ṭi^{h}/	'skin'
CVC	"bahm"	/pa^{h}m/	'shoulder'
CCV	"bráah"	/prá:^{h}/	'flour'
CCVC	"gyóht"	/kyó^{h}t/	'language'
V	"eeh"	/e:^{h}/	'4th year'
VC	no example		

(We have very few examples of word initial VC-syllables. Our failure to observe lax vowels in this syllable type probably represents an accidental gap in our corpus rather than a constraint on the occurrence of lax vowels.)

B. Pitch contours

1. Contrast

In the preceding section on voice quality we have seen that lax pronunciation of the vowel has a lowering effect on the relative height of the pitch. In addition we have within both groups, lax and tense, a further contrast between distinctive pitch contours.

In tense a high-falling contour contrasts with a mid-rising contour. These contrastive contours are a characteristic of the morpheme and stretch over the 1 to 3 syllables of the morpheme.

high-falling		mid-rising	
nam	'rain'	kang	'foot'
lungta	'prayer flag'	yungpa	'stone'
lapita	'Nepali shirt'	Tokoro	'a garment'

The fall in the first contour is much more drastic than the rise in the second. The second contour can be viewed as basically level.

In lax a mid-falling contour contrasts with a low slightly falling contour:

mid-falling		low-slightly-falling	
nooh	'garlic	suuh	'thigh'
meehme	'relatives'	syeehpa	'cooked rice'
gohngkare	'kind of food'	guhcili	'armpit'

Here again the fall in the first contour is much more drastic, and the second contour can be viewed as basically level.

The two intersecting systems of voice quality and pitch produce four contrasting patterns. The following chart shows approximately how the pitch contours compare with each other and what symbols are used to mark them phonemically and in text orthography.

	sharply falling	basically level
tense (relative high)	I "v́" /v́/	II "v" /v/
lax (relative low)	III "v́h"	IV "vh" /vh/

Minimal contrasts for pitch in pairs:

a) Tense

"lé"	le	'tongue'
"le"	le	'stalk'
"chí"	chi	'fat'
"chi"	chi	'grass'
"tá-pa"	ta-pa	'to knock down'
"ta-pa"	ta-pa	'to be (alright)'
"cúng-pa"	cung-pa	'to sell'
"cung-pa"	cung-pa	'to catch'
"phíi-pa"	phii-pa	'to peel'
"phii-pa"	phii-pa	'to sprout'

b) Lax

"máhr"	mahr	'boiled butter'
"mahr"	mahr	'gold'
"-máah"	-maah	'plural affix'
"maah"	maah	'son-in-law'
"Dáah"	Daah	'head belt for carrying'
"Daah"	Daah	'to win'
"jíih-pa"	jiih-pa	'to remember'
"jiih-pa"	jiih-pa	'to bite'
"gáhr-pa"	gahr-pa	'to belch'
"gahr-pa"	gahr-pa	'to lock up'
"Dúhp-pa"	Duhp-pa	'to sew'
"Duhp-pa"	Duhp-pa	'to plough, pull'

"Dóh-pa"	Doh-pa	'to sow'
"Doh-pa"	Doh-pa	'to be warm'

c) Minimal contrasts in triplets

"tá-pa"	ta-pa	'to knock down'
"ta-pa"	ta-pa	'to be (alright)'
"dah-pa"	dah-pa	'to discover, search for'
"páng-pa"	pang-pa	'to tell'
"pang-pa"	pang-pa	'to fall over'
"bahng-pa"	bahng-pa	'to fight with words'
"too-pa"	too-pa	'to need'
"dóoh-pa"	dooh-pa	'to return'
"dooh-pa"	dooh-pa	'to arrive at a distant place'
"syée-pa"	syee-pa	'to know'
"syee-pa"	syee-pa	'to go (hon)'
"syeehpa"	syeehpa	'cooked rice (hon)'
"na-pa"	na-pa	'to be ill'
"náh-pa"	nah-pa	'to rest'
"nah-pa"	nah-pa	'to raise'
"nga"	nga	'I'
"ngáh"	ngáh	'five'
"ngah"	ngah	'lama's drum'
"lá"	la	'month'
"la"	la	'god'
"lah"	lah	'mountain'

Theoretically we have the possibility of a four way contrast in the combined contrast systems of voice quality (tense/lax) and pitch (falls/basic level). However, to date no minimal contrast sets of four have been discovered. The following are only near minimal contrast sets:

"páng-pa"	pang-pa	'to tell'
"pang-pa"	pang-pa	'to fall over'
"jáhng-pa"	jahng-pa	'to put down words'
"bahng-pa"	bahng-pa	'to fight with words'
"lá"	la	'month'
"la"	la	'god'
"láah"	laah	'name of a flower'
"lah"	lah	'mountain'

As the contrast system is presented here, we have two systems of contrast intersecting with each other: the lax/tense voice quality system intersecting with the sharp fall/basic level pitch contour system. Checking with different Tamang speakers, I have observed that any speaker will readily recognize and affirm the lax/tense contrast, while the existence of the pitch contrasts is far less clear to them.

2. Variation and Distribution

a) On stems

We have already stated that the contrastive pitch contours are a characteristic of the morpheme and that they are "elastic". That is, they stretch out over the one to three syllables of a morpheme.

Tense high-falling :

"mráa"	mraa	'weed'
"mráp"	mrap	'door'
"séra"	sera	'hailstone'

"khánto"	khanto	'steep upwards'
"mátengi"	matengi	'an instrument used to make butter'

Tense mid-rising:

"sya"	sya	'meat'
"chyong"	chyong	'necklace'
"khriti"	khriti	'dirty'
"mingku"	mingku	'smoke'
"Tokoro"	Tokoro	'a garment'
"putali" (N)	putali	'butterfly'

Lax mid-falling:

"wáh"	wah	'wheat'
"gláhp"	glahp	'ox'
"múhna"	muhna	'night'
"yáhrnga"	yahrnga	'branch'
"góhleele"	gohleele	'slowly'
"góhngkare"	gohngkare	'a kind of food'

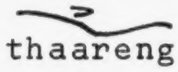
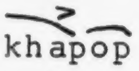
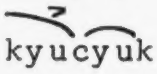
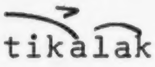
Lax low-slightly-falling:

"goh"	goh	'back'
"bahm"	bahm	'shoulder'
"gohca"	gohca	'big knife'
"guhrli"	guhrli	'bow'
"guhcili"	guhcili	'armpit'
"dahngsiri"	dahngsiri	'shrew'

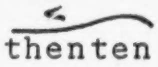
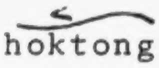
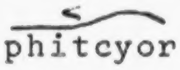
b) Impact of syllable patterns on pitch contours

No significant variations of the pitch contours have been observed in monosyllabic morphemes. In bi- and trisyllabic morphemes certain syllable patterns can effect quite drastic changes. In general a morpheme final -CVC syllable has a raising effect on pitch. The following variations have been observed:

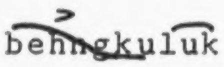
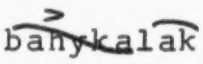
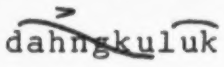
The tense high-falling contour of bi- and trisyllabic morphemes takes the following shape when the morpheme ends with a closed syllable:

"tháareng"	 thaareng	'far'
"khápop"	 khapop	'heaped'
"kyucyuk"	 kyucyuk	'narrow'
"tikalak"	 tikalak	'lizard'

The same raising effect of a closed final syllable we can observe in the tense mid-rising contour of bisyllabic morphemes, though here the variation is less strikingly audible than in the preceding examples:

"thenten"	 thenten	'empty'
"hoktong"	 hoktong	'deep'
"phitcyor"	 phitcyor	'outside'

A morpheme-final closed syllable also affects the lax mid-falling contour of trisyllabic morphemes:

"béhngkuluk"	 behngkuluk	'a bird's name'
"báhykalak"	 bahykalak	'swallow'
"dáhngkuluk"	 dahngkuluk	'grasshopper'

The tense mid-rising contour of trisyllabic morphemes with an initial closed syllable followed by open syllables takes the following shape:

"khentere"	khentere	'pheasant'
"sampani"	sampani	'a small ant'
"huntali"	huntali	'swing'
"ampale"	ampale	'a small fruit'

The tense mid-rising contour of tribyllabic morphemes with a long vowel in the second syllable shows the following variations: The rise is confined to the first syllable, on the second and third syllable we have a fall with quick crescendo and decrescendo. This pattern has only been observed on Nepali loan words:

"muraali"	muraali	'flute'
"suntaala"	suntaala	'orange'
"goraalo"	goraalo	'herdsman'
"jaraayo"	jaraayo	'deer'

c) Position of the affixes in the tone system

Regarding the tone system we have two types of affixes: Neutral (=atonal) affixes and distinct (=tonal) affixes. The majority of the suffixes is neutral, that is, their pitch is determined by the stem to which they are suffixed. The stem contour spreads over the neutral affixes. Tenseness or laxness of the vowel is not relevant in neutral affixes.

Neutral affixes with verb stems:

"khá"	kha	'to come' (stem)
"khá-pa"	kha-pa	'present'
"khá-pa-la"	kha-pa-la	'past perfect'
"khá-ri-pa-la"	kha-ri-pa-la	'past continuous'
"khá-ri-pa-la-ro"	kha-ri-pa-la-ro	'past continuous-rs'
"ngi"	ngi	'to go' (stem)
"ngi-pa"	ngi-pa	'present'

Neutral affixes with verb stems:

"kha"	kha	'to come' (stem)
"kha-pa"	kha-pa	'present'
"kha-pa-la"	kha-pa-la	'past perfect'
"kha-ri-pa-la"	kha-ri-pa-la	'past continuous'
"kha-ri-pa-la-ro"	kha-ri-pa-la-ro	'past continuous-rs'
"ngi"	ngi	'to go' (stem)
"ngi-pa"	ngi-pa	'present'

"ngi-pa-la"	ngi-pa-la	'past perfect'
"ngi-ri-pa-la"	ngi-ri-pa-la	'past continuous'
"ngi-ri-pa-la-ro"	ngi-ri-pa-la-ro	'past continuous-rs'
"jíih"	jiih	'to remember' (stem)
"jíih-pa"	jiih-pa	'present'
"jíih-pa-la"	jiih-pa-la	'past perfect'
"jíih-ri-pa-la"	jiih-ri-pa-la	'past continuous'
"jíih-ri-pa-la-ro"	jiih-ri-pa-la-ro	'past continuous-rs'
"jiih"	jiih	'to bite' (stem)
"jiih-pa"	jiih-pa	'present'
"jiih-pa-la"	jiih-pa-la	'past perfect'
"jiih-ri-pa-la"	jiih-ri-pa-la	'past continuous'
"jiih-ri-pa-la-ro"	jiih-ri-pa-la-ro	'past continuous-rs'

Neutral affixes with nouns:

"phúm"	phum	'egg'
"phúm-ri"	phum-ri	'in the egg'
"phúm-ri-ee"	phum-ri-ee	'in the egg too'
"phúm-ri-ee-no"	phum-ri-ee-no	'in the egg too, emph.'
"námsa"	namsa	'village'
"námsa-ri"	namsa-ri	etc.
"námsa-ri-ee"	namsa-ri-ee	
"námsa-ri-ee-no"	namsa-ri-ee-no	
"mátengi"	matengi	'instrument to make butter'
"mátengi-ri"	matengi-ri	etc.

"mátengi-ri-ee"	matengi-ri-ee	
"mátengi-ri-ee-no"	matengi-ri-ee-no	
"pha"	pha	'husband'
"pha-ta"	pha-ta	'to the husband'
"pha-ta-ee-no"	pha-ta-ee-no	'to the husband too, emph.'
"ama"	ama	'mother'
"ama-ta"	ama-ta	'to the mother'
"ama-ta-ee-no	ama-ta-ee-no	'to the mother, too, emph.'
"gyáhm"	gyahm	'path'
"gyáhm-ce"	gyahm-ce	'by the path'
"gyáhm-ce-ee-no"	gyahm-ce-ee-no	'by the path, emph.'
"gúhri"	guhri	'cat'
"gúhri-ce"	guhri-ce	'by the cat'
"gúhri-ce-ee-no"	guhri-ce-ee-no	'by the cat, emph.'
"béhngkuluk"	behngkuluk	'a kind of bird'
"béhngkuluk-ce"	behngkuluk-ce	'by the bird'
"béhngkuluk-ce-ee-no"	behngkuluk-ce-ee-no	'by the bird, emph.'
"mahng"	mahng	'dream'
"mahng-ce"	mahng-ce	'by the dream'
"mahng-ce-mi"	mahng-ce-mi	'by the dream then'
"mehnto"	mehnto	'flower'
"mehnto-ce"	mehnto-ce	'by the flower'
"mehnto-ce-mi"	mehnto-ce-mi	'by the flower then'

"dahngsiri"	dahngsiri	'shrew'
"dahngsiri-ce"	dahngsiri-ce	'by the shrew'
"dahngsiri-ce-mi"	dahngsiri-ce-mi	'by the shrew then'

A small number of affixes is distinctive, that is, they are not under the influence of the stem to which they are affixed, but have a distinctive pitch contour throughout their distribution.

Plural affix "-máah"

"káa-máah"	kaa-maah	'blood-pl'
"túngra-máah"	tungra-maah	'ginger-pl'
"rhin-máah"	rhin-maah	'bamboo-pl'
"tamra-máah"	tamra-maah	'bean-pl'
"nóoh-máah"	nooh-maah	'garlic-pl'
"gáhlta-máah"	gahlta-maah	'bag-pl'
"jah-máah"	jah-maah	'son-pl'
"grahmpa-máah"	grahmpa-maah	'cheek-pl'

Attitude suffix "-sihm"

"the cúng-o-sihm."	the cung-o-sihm	'So let him sell.'
"the cung-o-sihm."	the cung-o-sihm	'So let him catch it.'
"the jíih-ko-sihm."	the jiih-ko-sihm	'So let him remember.'
"the jiih-ko-sihm."	the jiih-ko-sihm	'So let him bite.'

Prefixes

The two negative prefixes are the only prefixes of the language. They are distinctive. Normally they only occur before stems, and each component retains its own pitch contour.

"the-ce tila á-cúng."	the-ce tila a-cung	'He didn't sell yesterday'

"the-ce tila á-cung."	the-ce-tila a-cung	'He didn't catch yesterday.'
"the-ce tila á-jíih."	the-ce tila a-jiih	'He didn't remember yesterday.'
"the-ce tila á-jiih."	the-ce tila a-jiih	'He didn't bite yesterday.'
"tíngi tha-cúng-o."	tingi tha-cung-o	'Don't sell today.'
"tíngi tha-cung-o."	tingi tha-cung-o	'Don't catch today.'
"tíngi tha-jíih-ko."	tingi tha-jiih-ko	'Don't remember today.'
"tíngi tha-jiih-ko."	tingi tha-jiih-ko	'Don't bite today.'

The negation of Nepali loan verbs is somewhat odd in that "á-" follows the stem and its pitch contour dominates the following neutral suffixes.

"rók-ti-pa-la"	rok-ti-pa-la	'stopped'
"rók-á-ti-pa-la"	rok-a-ti-pa-la	'not stopped'
"cun-ti-pa-la"	cun-ti-pa-la	'elected'
"cun-á-ti-pa-la"	cun-a-ti-pa-la	'not elected'
"dóohr-ti-pa-la"	doohr-ti-pa-la	'repeated'
"dóohr-á-ti-pa-la"	doohr-a-ti-pa-la	'not repeated'
"mahn-ti-pa-la"	mahn-ti-pa-la	'celebrated'
"mahn-á-ti-pa-la	mahn-a-ti-pa-la	'not celebrated'

(In the imperative negative "tha-" precedes the stem and behaves like before non-loan stems.)

Neutral suffixes following a distinctive suffix fall under the influence of the pitch contour of the distinctive suffix.

"kóla-máah-ce-no"	kola-maah-ce-no	'child-pl-A-emph.'
"mee-máah-ce-no"	mee-maah-ce-no	'tail-pl-A-emph.'
"dóhngpo-máah-ce-no"	dohngpo-maah-ce-no	'tree-pl-A-emph.'
"roh-máah-ce-no"	roh-maah-ce-no	'friend-pl-A-emph.'

Compound words and neutral suffixes:

The neutral suffixes fall naturally under the influence of the pitch contour of the second item.

"káa-jyahng-ri"	kaa-jyahng-ri	'in the vein'
"me-láhm-ee-no"	me-lahm-ee-no	'the flame too'
"yaa-chín-ce"	yaa-chin-ce	'with the fingernail'
"byohn-chame-ta"	byohn-chame-ta	'to the ladies and gentlemen"

Compound verbs:

"the cúng-pin-sa-mi"	the cung-pin-sa-mi
he sell-give-cond-At	'if he sells... (benefactive)'
"the cung-pin-sa-mi"	the cung-pin-sa-mi
catch	'if he catches...'
"the jíih-pin-sa-mi"	the jiih-pin-sa-mi
remember	'if he remembers...'
"the jiih-pin-sa-mi"	the jiih-pin-sa-mi
bite	'if he bites...'

Echo words: Bisyllabic echo words do not fit into the bisyllabic pitch patterns of the morpheme but they behave like compounds in which the same morpheme is repeated twice.

"cékcék"	cekcek	'a little'
"yóyó"	yoyo	'early'
"wáhngwáhng"	wahngwahng	'spider'
"syosyo"	syosyo	'paper'
"buhrbuhr"	buhrbuhr	'feather'

d) Pitch variation under intonation

The bearing of intonational stress and intonational pitch contours on the lexical pitch has not yet been studied in detail, but some fragmentary statements can be made at this point of the analysis.

We have already stated that one of the characteristics of the end of a phonological phrase is an intonational stress with upstep in pitch followed by pitch rise. Neutral suffixes in this position are no longer under the influence of the overriding intonation.

Illustrations:

ˆ symbolizes a very short juncture
/ symbolizes a longer juncture
// symbolizes a long juncture
# symbolizes end of utterance
v gloss for verbal affixes
At gloss for attitude affixes

cu jah-teng / roh-ce/ sehng-pa-la #

this son-and friend-A do-v-v

"cú jah-teng roh-ce sehng-pa-la."

'The son and a friend did this.'

cu yoh-teng/ roh-ce / sehng-pa-la #

thief

"cú yóh-teng roh-ce sehng-pa-la."

'The thief and a friend did this.'

cu kola-teng / roh-ce sehng-pa-la#

child

"cú kóla-teng roh-ce sehng-pa-la."

'The child and a friend did this.'

cu acyo-teng / roh-ce sehng-pa-la #

brother

"cú acyo-teng roh-ce sehng-pa-la."

'The brother and a friend did this.'

Compare the following utterances with each other, paying special attention to the behaviour of neutral suffixes before the junctures.

nga-ce^tapu-ta / naah-ci #

I-A horse-to chase-v

"nga-ce tápu-ta naah-ci."

'I chased the horse."

nga-ce^tapu-ta-no / naah-ci #

emph

"nga-ce tápu-ta-no naah-ci."

'I chased the horse.'

the cung-ma-mi // nga ngi-ci #

he sell-v-At I go-v

"the cúng-ma-mi, nga ngi-ci."

'While he was selling I went.'

cu kola-la-mi^dihm yihm-pa #

this child-of-At house be-v

"cu kóla-la-mi díhm yihm-pa."

'This now is the house of the child.'

In the following observe the different behaviour of "-pa" before different junctures.

Before a longer juncture:

the^cung-pa / kham-pa #	"the cúng-pa kham-pa."
he sell-v can-v	'He can sell it.'
the^cung-pa / kham-pa #	"the cung-pa kham-pa."
catch	'He can catch it.'
the^jiih-pa / kham-pa #	"the jíih-pa kham-pa."
remember	'He can remember it.'
the^jiih-pa / kham-pa #	"the jiih-pa kham-pa."
bite	'He can bite.'

Before a very short juncture:

the^ cung-pa^ syee-pa #	"the cúng-pa syée-pa."
sell	'He knows selling.'
the^ cung-pa^ syee-pa #	"the cung-pa syée-pa."
catch	'He knows catching.'
the^ jiih-pa^ syee-pa #	"the jíih-pa syée-pa."
remember	'He is able to remember.'
the^ jiih-pa^ syee-pa #	"the jiih-pa syée-pa."
bite	'He knows biting.'

Note also the following possibility of pitch variation in a bisyllabic morpheme before a juncture.

the-la bohmpo guhring Daah-pa #
"the-la bohmpo guhring Daah-pa."

the-la bohmpo // guhring Daah-pa #

he-of shaman (next year) win-v
'His shaman will win next year.'

Monosyllabic stems before juncture.

Note how the contrasts are maintained in spite of the juncture rise.

the-la pha / guhring Daah-pa #

"the-la pha guhring Daah-pa."

'Her husband will win next year.'

the-la mii / guhring Daah-pa #

"the-la míi guhring Daah-pa."

'His eye will win next year.'

the-la ket / guhring Daah-pa #

"the-la két guhring Daah-pa."

'His voice will win next year."

the-la maah / guhring Daah-pa #

"the-la maah guhring Daah-pa."

'His son-in-law will win next year.'

the-la graah / guhring Daah-pa #

"the-la gráah guhring Daah-pa."

'His spirit will win next year.'

(In open syllables the vowel before the juncture has extra length, in closed syllables the closing consonant. A voiceless consonant cuts off the intonation rise but its extra length is striking enough to take over the function of the rise.)

In the contrastive intonation patterns of the phonological sentence it is generally the last syllable of the sentence which carries the heaviest manifestation of the contrast. The following examples illustrate the behaviour of syllables in this position.

Neutral affix before a definite "full stop."

tingi naa-ko #	"tíngi náa-ko."
today carry-v	'Carry it today.'
tingi pang-o #	"tíngi pang-o."
say	'Say it today.'
tingi baah-ko #	"tíngi báah-ko."
(pile up)	'Pile it up today.'
tingi goh-ko #	"tíngi goh-ko."
understand	'Understand it today.'

Neutral affix before a "non-definite stop."

nahmsyo tha-naa-ko #	"nahmsyo tha-náa-ko."
tomorrow not-carry-v	'Don't carry it tomorrow.'
nahmsyo tha-pang-o #	"nahmsyo tha-pang-o."
say	'Don't say it tomorrow.'
nahmsyo tha-baah-ko #	"nahmsyo tha-baah-ko."
(pile up)	'Don't pile it up tomorrow.'
nahmsyo tha-goh-ko #	"nahmsyo tha-goh-ko."
understand	'Don't understand it tomorrow.'

Neutral affix under question intonation.

the-ce chum-pa-rim-ka #	"the-ce chúm-pa-rim-ka?"
hide	'So he is hiding it?'

the-ce gluh-pa-rim-ka #	"the-ce glûh-pa-rim-ka?"
buy	'So he is buying it?'

Distinctive affix before "non-definite stop."

the khru-ko-sihm #	"the khrú-ko-sihm."
he wash-v-At	'Let him wash then.'
the byuhng-o-sihm #	"the byuhng-o-sihm."
cough	'Let him cough then.'

Distinctive affix before a "definite full stop."

the byuhng-o-sihm #	"the byuhng-o-sihm."
cough	'So let him cough.'

C. Stress

Some observations about word stress and intonational stress:

1. In Western Tamang the basic word stress falls always on the first syllable of a word.
2. Intonational stress on the last syllable of a word before a phrase juncture or sentence final can be quite intense and change the pattern. This variation, however, is conditioned by higher level intonation factors.
3. As to word stress the tense mid-rising contour tends to be deceptive, especially on bi- and tri-syllabic morphemes or words because the first syllable is lower than the following. A tuned ear, however, hears the word stress on the first syllable in spite of the rise on the second. For the same reason of biased hearing, both contours with the sharp falls sound more heavily stressed than their lower counterparts without sharp falls.

   Word stress in Western Tamang, however, is not manifested by high pitch and falls, but by a certain intensity in the consonant and vowel onset of the stressed syllable and a slight degree of length on the closing element of the syllable.

Intonational stress uses the same manifestations to a much larger degree and adds the element of high pitch combined with rises, falls, crescendos and decrescendos.

III. Brief comparison of the Tone systems of Western Tamang and Thakali

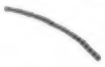
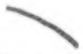
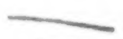
A. Introduction

Geographically the Thakali area and Western Tamang area fall side by side and the two languages are quite closely related. (They share 57 percent cognates according to calculations W. Glover made with the 100-word Swadesh list. See 'Cognate Counts via the Swadesh List in some Tibeto Burman Languages of Nepal' elsewhere in this report.) We can therefore expect some similarities in the tone systems of the two languages. The following comparison of the two systems shows indeed that they operate on the same principles. Both languages have the morpheme as the basic unit of the tone system, and we have two types of affixes, tonal and atonal.

Thakali

	contour	level
clear (tense)	I extra high-falling	II high
breathy (lax)	III low rising-falling	IV low

Western Tamang

	sharply falling	basically level
tense	I  high-falling	II mid-rising
lax	III  mid-falling	IV  low-slightly falling

B. Correspondence in voice quality

The examination of cognates shows clearly that "clear" in Thakali corresponds to "tense" in Western Tamang, and "breathy" in Thakali to "lax" in Western Tamang. In 100 cognates examined only two pairs show non-corresponding voice quality, in 98 pairs the voice quality corresponds regularly.

C. Correspondence of pitch contours

As to the pitch contours, the Thakali low-rising-falling (III) corresponds to the Tamang mid-falling (III), and the Thakali low level (IV) to the Tamang low basically level (IV). Out of of 58 lax pairs 54 pairs show this correspondence. In only four pairs the pitch is reversed.

For the tense pitch contours the correspondence is much less clear. On phonetic grounds we would expect the two high falls (I) and the basically level ones (II) to correspond. Out of the 40 tense pairs, however, only 15 pairs show this correspondence. In the remaining 25 pairs the pitch contours are reversed. We find the levels corresponding to the falls. With this small rate of correspondence it seems arbitrary to make a statement of correspondence. This can throw some light on the experience of the investigator while analysing the tone of the two languages. After some tuning in the pitch contrast in the lax groups was quite easily perceived while in the tense groups it was a good deal more difficult to identify the pitch.

D. Cognates used for the counts

The following list of cognates is transcribed in text orthography. In Thakali the contours (I and III) are marked with accent before the first stem syllable, the levels (II and IV) are unmarked.

Tamang	Thakali	English
cúng-pa	cung-pa	'to sell'
rúng-pa	Rung-pa	'to watch'
thúng-pa	thung-pa	'to drink'
chúm-pa	chum-pa	'to hide'
ngóm-pa	ngom-pa	'to show'
náa-pa	naa-wa	'to carry'
ná-pa	na-wa	'to be ill'
cyúp-pa	cyup-pa	'to lock in'
púng-pa	pum-pa	'to shoot'
táa-pa	taa-wa	'to hold out'
láa-pa	laa-wa	'to hide'
kóla	kolaa	'child'
wóla	ola	'red'
óngye	ongye	'some time ago'
mlép-pa	mle-wa	'to forget'
mu-pa	'mu-wa	'to be'
ca-pa	'ca-wa	'to eat'
la-pa	'la-wa	'to do'
mra-pa	'mra-wa	'to light'
khya-pa	'khe-wa	'to patch'
plaa-pa	'ple-wa	'to slip'

Tamang	Thakali	English
ama	'aama	'mother'
acyo	'aacyo	'elder brother'
ngyamngya	'nemyaa	'bird'
ta-pa	'ta-wa	'to be'
ána	'aana	'elder sister'
mráp	'mraakhaa	'door'
khá-pa	'kha-wa	'to come'
yuu-pa	yu-wa	'to pour out'
syee-pa	sye-wa	'to go (hon.)'
lop-pa	Lap-pa	'to learn'
pii-pa	pi-wa	'mashy, muddy'
too-pa	to-wa	'to need'
khla-pa	khyaa-wa	'to throw away'
kham-pa	kham-pa	'to be able'
khar-pa	khar-wa	'to dry'
syal-pa	syal-pa	'to scrub'
mrang-pa	mraang-pa	'to see'
naka	naakaa	'hen'
yungpa	yumpa	'stone'
rii-pa	'rih-wa	'to scratch'
'juuh-pa	cu-wa	'to bark'
núuh-pa	'nuh-wa	'to sleep'
bráh-pa	'prah-wa	'to walk'
Dóh-pa	'Toh-wa	'to be hot'

Tamang	Thakali	English
jáhng-pa	'caahng-pa	'to put, send'
jíih-pa	'cih-wa	'to remember'
bréhm-pa	'prahm-pa	'to wait'
Dúhp-pa	'Tuhp-pa	'to sew'
ngóhp-pa	'ngohy-wa	'to call'
glúh-pa	'kyuh-wa	'to buy'
báh-pa	'paah-wa	'to bring'
duuh-pa	tuh-wa	'to be tired'
bahng-pa	paahng-pa	'to fight with words'
goh-pa	koh-wa	'to understand'
bluhm-pa	pluhm-pa	'to drown'
nah-pa	nah-wa	'to raise'
jiih-pa	cih-wa	'to bite'
rahp-pa	rahp-pa	'to play'
dahr-pa	tahr-wa	'to tremble'
Doh-pa	toh-wa	'to sow'
yihm-pa	ihm-pa	'to be'
myahng-pa	myaahng-pa	'to taste'
méh	'meh	'cow'
blúh	'pluh	'seed'
ngíih	'ngih	'two'
gyúuh	'kyuh	'sheep'
nóoh	'noh	'garlic'
bráah	'praah	'flour'
Dáah	'Taah	'carrying belt'

Tamang	Thakali	English
ngyéht	'ngyeh	'liver'
gyáhm	'kyahm	'path'
gíih	'Tih	'one'
dóhngpo	'Tuhng	'tree'
yáhrnga	'yaahlkaa	'branch
dáhprang	'tahpraang	'crow'
blíh	'plih	'four'
ngáh	'ngah	'five'
Dúuh	'Tuh	'six'
bréht	'preh	'eight'
jah	cah	'son'
ngyeh	ngyeh	'milk'
goh	koh	'back'
joh	coh	'point'
roh	roh	'friend'
miih	mih	'man'
liih	lih	'body'
maah	maah	'son-in-law'
daah	taah	'pole'
braahng	praahng	'hut'
gohca	kohca	'knife'
buhlung	puhlung	'bug'
mehnto	mehnto	'flower'
grahmpa	Tahmpa	'cheek'
dihngi	tihngi	'sunshine'
baah	paah	'leaf'

Tamang	Thakali	English
mahng	'maahng	'dream'
léhm-pa	lehm-pa	'to lick'
máh-pa	mah-wa	'to loose'
bíh-pa	pih-wa	'to say'

Note on Segmentals

The study of the tone system of Western Tamang as presented here has at some points resulted in different views on segmentals from D. Taylor's Tamang Segmental Synopsis. The divergencies are the following:

1. /h/ occurs as a phoneme. Where in the Tamang Segmental Synopsis [h] has been interpreted as an automatic onset of word initial breathy vowels, we have to distinguish [h] from [ĥ]. Breathy vowels have the non-contrastive [ĥ] onset when occurring word initial, but the [h] is contrastive before clear vowels. It contrasts with word initial [?] before clear vowels. [?] is taken to be the normal onset of clear vowels word initially and there is no need to accord phonemic status to it. /h/, parallel to other aspirated consonants, does not occur before breathy vowels.

2. [ñ] has been interpreted as /ny/. I would like to interpret it as an allophone of /ŋ/ for the following reasons:

   --phonetically I hear a very fronted [ŋ̭].
   --the literate informant always transcribes it with the Devanagari symbol for /ŋ/.

   It has the following distribution:

   [ŋ̭] occurs only before i-vowel quality and /y/.
   /y/ does not cluster with /n/, (symmetrically to /t/), but it clusters with /ŋ/.
   /ŋy/ does not occur (or is non-contrastive) before i-vowel quality. This is also relevant for any consonant clustering with /y/.

3. Interpretation of [i/y] and [u/w].
   The vocoid sequences [ai, ui, oi, au] have been interpreted as sequences of two syllables: /a.i, u.i, o.i, a.u/. The study of the possible syllable patterns for the morpheme, however, has shown that in no other case a sequence of an open syllable followed by a V-syllable is possible within the morpheme.

(Cf. I. 3. p.8). If [i] and [u] are interpreted as separate syllables, we get this sequence: open syllable plus V-syllable within the morpheme, but the vowel of the V-syllable can only be /i/ or /u/.

Examples:

/na.i.pa/	'to put to sleep'	/hu.i.pa/	'to push'
/mo.i.pa/	'to plough'	/k^{h}á.u/	'come!'

We also would expect to find the sequence: open syllable plus VC-syllable, but this does not occur. [i] and [u] in this position are never followed by a syllable closing consonant. It seems therefore simpler (and phonetically this can also be justified) to interpret [i] and [u] in this position as semi vowels: /y/ and /w/. The morphemes involved then fit into the possible syllable patterns for the morpheme without leaving asymmetrical gaps. The examples above will read:

/nay.pa/	'to put to sleep'	/huy.pa/	'to push'
/moy.pa/	'to plough'	/k^{h}áw/	'come!'

THAKALI TONE AND HIGHER LEVELS

Maria Hari

[The Thakali tone system may be characterized in terms of two kinds of contrasts, contrasts for breathiness and contrasts for pitch contour. The domain of these contrasts is the morpheme, which may in general be monosyllabic, disyllabic or trisyllabic. The following generalizations may be stated: 1) Contrast between breathy and clear is relevant only to the first syllable of a morpheme. 2) The pitch contour of a morpheme extends over the whole morpheme, whether it has one, two, or three syllables. (There appears to be just one exception to this. In clear falling trisyllabic morphemes, the last syllable is level, see II B. below.) A coherent account of Thakali tone must thus include an account of the syllable, breathiness (voice quality), and pitch. These sections have been reproduced from Hari (1969) for inclusion in this report.]

I. Higher levels.

A. Syllable.

1. Contrast.

We have the following six patterns for the emic syllable:

V CV CCV VC CVC CCVC

V		
"'aana"	/'anɔ/	'elder sister'
"u"	/u/	'cave'
CV		
"pu"	/pu/	'earthen pot'
"'toh"	/'to^{h}/	'ground floor'
CCV		
"plaa"	/pla/	'vegetable'
"'preh"	/'pre^{h}/	'eight'

VC

"ur"	/ur/	'yellow'
"'ohm"	/'oʰm/	'to entice'

CVC

"min"	/min/	'name'
"'pehn"	/'peʰn/	'young man'

CCVC

"mrin"	/mrin/	'woman'
"pyaahng"	/pyaʰŋ/	'tune'

A seventh syllable type occurs: CCCV. For this type only two examples are available:

/pʰryawɔ/	[pʰ$\overline{\text{ryæwɔ}}$]	'thin'
/plyawɔ/	[pl$\overline{\text{yæwɔ}}$]	'flat'

The latter has an alternative pronunciation which is preferred:

/plewɔ/	[pl$\overline{\text{ewɔ}}$]	'flat'

This and the fact that these two examples are the only ones out of more than 2000 words suggest that they should be treated as exceptions which do not fit the overall pattern of the language.

2. Variation.

Consonant clusters within the syllable: Consonant clustering occurs only syllable initial, and there is a very small number of combinatorial possibilities.

The following chart expresses the combinatorial possibilities for the syllable initial CC-clusters. (It does not take into account the exceptional CCC sequence noted above.)

first C		second C	yields:		
/p/		/r/	/pr/	/mr/	/p^{h}r/
/p^h/		/l/	/pl/	/ml/	/p^{h}l/
/m/		/y/	/py/	/my/	/p^{h}y/
/c^h/			/c^{h}y/		
/c/			/cy/		
/k^h/		/y/	/k^{h}y/		
/k/			/ky/		
/s/			/sy/		
/ŋ/			/ŋy/		
/t/		/r/	/tr/		
/k/		/w/	/kw/		
/t^h/		none			
/ṭ^h/	/ṭ/				
/h/	/n/				
/ł/	/l/				
/r̲/	/r/				
/y/	/w/				

Illustrations:

"pro"	/pro/	'snack'
"'plih"	/'pli^h/	'four'
"pyaang"	/pyaŋ/	'pathi'
"mram"	/mrɔm/	'wooden chest'
"'mlohwa"	/'mlo^{h}wɔ/	'to pierce'

"myaang"	/myaŋ/	'must'
"phran"	/pʰrɔn/	'to unfasten'
"phle 'la''	/pʰle 'lɔ/	'to open up'
"phyong"	/pʰyoŋ/	'to jump'
"chyo"	/cʰyo/	'direction'
"cyah"	/cyɔʰ/	'tea'
"khyaawa"	/kʰyawɔ/	'throw away'
"kyalwa"	/kyɔlwɔ/	'to swim'
"sya"	/syɔ/	'meat'
"ngyewa"	/ŋyewɔ/	'to laugh'
"truhma"	/truʰmɔ/	'next year'
"kwaahri"	/kwaʰri/	'up there'

Within a single syllable no vowel clusters occur.

3. Distribution.

Syllables with breathy vowels occur only in the first syllable-slot of a morpheme.

The contrastive pitch features are a characteristic of the morpheme, and in disyllabic morphemes they are spread over both syllables of the morpheme. (Compare II. B. 2. below).

II. Tone

A. Voice quality.

1. Contrast.

The contrast between clear and breathy vowels is striking and used very widely in Thakali. The tongue and lip position of the breathy vowel is the same as for the clear vowels, but the breathy vowels have a different voice quality. For the clear ones the Adam's apple remains raised while for the breathy ones the Adam's apple is lowered and the throat expanded. This results in a larger resonance chamber in the back of the mouth and the vowel takes on a different voice quality. At the same time the pitch of the breathy vowel is lower than the pitch of the clear one in the same stress position. The difference in pitch is considerable. The term breathy is kept for traditional reasons and for the lack of a better term, but in Thakali it could be misleading, for it is only in overdistinct speech that a breath is audible. In normal speech, it is the low pitch and the lax voice quality which are prominent. When a person is pronouncing a breathy vowel, we can observe externally the tightening of the muscles of the front part of the neck and if a person has a protruding Adam's apple, the lowering of it is also visible. There is a large number of clear/breathy pairs which contrast in meaning. A few of these are given below.

Monosyllables:

"mi"	/mi/	[$\overline{\text{mĭ}}$]	'eye'
"mih"	/mi^{h}/	[$\underline{\text{mĭ}^{h}}$]	'person'
"le"	/le/	[$\overline{\text{le}}$]	'tongue'
"leh"	/le^{h}/	[$\underline{\text{le}^{h}}$]	'act'
"saa"	/sa/	[$\overline{\text{sa}}$]	'breath'
"'saah"	/'sa^{h}/	[$\underset{\smile}{\text{sa}^{h}}$]	'lost'
"kyu"	/kyu/	[$\overline{\text{k̭yu}}$]	'water'
"'kyuh"	/kyu^{h}/	[$\underset{\smile}{\text{k̭yu}^{h}}$]	'sheep'
"ngo"	/ŋo/	[$\overline{\text{ŋ}^{w}\text{ŏ}}$]	'hair parting'
"ngoh"	/ŋo^{h}/	[$\underline{\text{ŋ}^{w}\text{ŏ}^{h}}$]	'forehead'
"ca"	/cɔ/	[$\overline{\text{tsɔ}}$]	'that'
"cah"	/cɔ^{h}/	[$\underline{\text{tsɔ}^{h}}$]	'son'
"pen"	/pen/	[$\overline{\text{pen}}$]	'small frog'
"'pehn"	/$\text{'pe}^{h}\text{n}$/	[$\underset{\smile}{\text{pe}^{h}}\text{n}$]	'young man'
"myaang"	/myaŋ/	[$\overline{\text{myaŋ}}$]	'must'

"myaahng"	/myaʰŋ/	[myaʰŋ]	'to taste'
"tum"	/tum/	[t͓um]	'to wrap'
"tuhm"	/tuʰm/	[t͓uʰm]	'to spin'
"tong"	/toŋ/	[t͓oŋ]	'new moon'
"'tohng"	/'toʰŋ/	[t͓oʰŋ]	'spindle'
"tar"	/tɔr/	[t͓ɔr̽]	'white'
"tahr"	/tɔʰr/	[t͓ɔʰr̽]	'a silk cloth'

Disyllables:

"'tingi"	/'tiŋi/	[ṱiŋ̭ĩ]	'today'
"tihngi"	/tiʰŋi/	[ṱiʰŋ̭iͬ]	'sun'
"rimpa"	/rimpɔ/	[r̽imbɔ]	'short'
"rihmpa"	/riʰmpɔ/	[r̽iʰmbɔ]	'long'
"ngimpa"	/ŋimpɔ/	[ŋ̭ĩmbɔ]	'old'
"ngihmpa"	/ŋiʰmpɔ/	[ŋ̭iͬʰmbɔ]	'fear'
"Taangpa"	/ṭaŋpɔ/	[ṭaŋbɔ]	'to break'
"Taahngpa"	/ṭaʰŋpɔ/	[ṭaʰŋbɔ]	'to offer'
"paangpa"	/paŋpɔ/	[paŋbɔ]	'to abstain'
"paahngpa"	/paʰŋpɔ/	[paʰŋbɔ]	'to quarrel'
"'caca"	/'cɔcɔ/	[tsɔtsɔ]	'salt'
"cahca"	/cɔʰcɔ/	[tsɔʰtsɔ]	'baby'

In this section pitch contours are phonemically and orthographically marked with /'/ and "'" respectively, before the syllable, level pitches are not marked. For more details see section II. B. and C.

2. Variation.

Breathy vowels occurring word initially are preceded by aspiration. Word finally they are followed by some aspiration. Word medial no aspiration can be heard.

"ihmu"	/iʰmu/	[hiʰmu]	'is'
"eh'lawa"	/eʰ'lɔwɔ/	[heʰ lɔwɔ]	'to dress up'
"uhp"	/uʰp/	[ʷhuʰp]	'musty'
"peh"	/peʰ/	[peʰh]	'wife'
"nah"	/nɔʰ/	[nɔ̃ʰh]	'ear'
"'kyuh"	/'kyuʰ/	[k̭yuʰh]	'sheep'
"nohngori"	/noʰŋori/	[nõʰŋõři]	'mornings'
"puhrri"	/puʰrri/	[puʰr̂·i]	'below'
"tahna"	/tɔʰnɔ/	[ṱɔʰnɔ]	'many'

3. Distribution.

a) Breathiness is relevant only on the first syllable of a morpheme. In two syllable morphemes we get only the sequences clear + clear syllable and breathy + clear syllable.

"kohca"	/koʰcɔ/	[koʰtsɔ]	'big knife'
"pahle"	/pɔʰle/	[pɔʰle]	'foot'
"sihtaang"	/siʰtaŋ/	[siʰt̂aŋ]	'anger'
"'tuhli"	/'tuʰli/	[ṱuʰli]	'tailor'
"'cahme"	/'cɔʰme/	[tsɔʰmẽ]	'daughter'
"'nahma"	/'nɔʰmɔ/	[nɔ̃ʰmɔ̃]	'swamp'
"'aama"	/'amɔ/	[?amɔ]	'mother'
"'tapaang"	/'tɔpaŋ/	[ṱɔpàŋ]	'Thakali'
"thorong"	/tʰoroŋ/	[ṱʰořoŋ]	'first'

b) Breathy vowels do not occur after aspirated stops, the aspirated affricate, and the voiceless phonemes /ɨ, r̲/ and /h/. Here only clear vowels occur.

"phaamar"	/pʰamɔr/	[p̅ʰa̅m̅ɔ̆̅ř̅]	'north wind'
"thaasaang"	/tʰasaŋ/	[ṱ̅ʰa̅s̅a̅ŋ̅]	'Thak Khola'
"chong"	/cʰoŋ/	[tsʰo̅ŋ̅]	'business'
"Thicam"	/ṭʰicɔm/	[ṭ̅ʰi̅t̅s̅ɔ̅m̅]	'only'
"khoro"	/kʰoro/	[kʰo̅ř̅o̅]	'upwards'
"Lap"	/ɬɔp/	[ɬ̅ɔ̅p̅]	'hot'
"Rup"	/r̲up/	[r̲̅u̅p̅]	'thread'
"haang"	/haŋ/	[h̅a̅ŋ̅]	'court yard'

It is after the unaspirated stops, affricate, after /s/, after the voiced consonants and in syllable initial vowels where we get the clear/breathy contrasts.

"pulu"	/pulu/	[p̅u̅l̅u̅]	'hat'
"puhlung"	/puʰluŋ/	[p̲u̲ʰl̲u̲ŋ̲]	'bug'
"tim"	/tim/	[ṱ̅i̅m̅]	'at once'
"'tihm"	/'tiʰm/	[ṱiʰm]	'house'
"'cikaa"	/'cika/	[ṱšika]	'barley'
"cihkaang"	/ciʰkaŋ/	[ṱš̲i̲ʰk̲a̲ŋ̲]	'storeroom'
"Taar"	/ṭar/	[ṭ̅a̅ř̅]	'rack'
"Taahngse"	/ṭaʰŋse/	[ṭ̲a̲ʰŋ̲š̭̲e̲]	'apiece'
"kum"	/kum/	[k̅u̅m̅]	'fist'
"kuhng"	/kuʰŋ/	[k̲u̲ʰŋ̲]	'middle'
"sung"	/suŋ/	[s̅u̅ŋ̅]	'mouth'
"suhr"	/suʰr/	[s̲u̲ʰř̲]	'corner'
"mom"	/mom/	[m̅õ̅m̅]	'grandmother'
"mohmci"	/moʰmci/	[m̲ŏ̲ʰm̲dž̭i̲]	'chin'
"naangi"	/naŋi/	[n̅ă̅ŋ̬̅ɪ̅]	'the day after tomorrow'

"naahngri"	/na$^{\text{h}}$ŋri/	$[\underline{\text{nă}^{\text{h}}\text{ŋři}}]$	'inside'
"ngongo"	/ŋoŋo/	$[\text{ŋ}\overline{^{\text{w}}\text{ŏŋŏ}}]$	'before'
"ngohnaa"	/ŋo$^{\text{h}}$na/	$[\underline{\text{ŋ}^{\text{w}}\text{ŏ}^{\text{h}}\text{na}}]$	'night'
"le"	/le/	$[\overline{\text{le}}]$	'tongue'
"lehm"	/le$^{\text{h}}$m/	$[\underline{\text{le}^{\text{h}}\text{m}}]$	'word'
"rewa"	/rewɔ/	$[\overline{\text{řewɔ}}]$	'to get up'
"rehwa"	/re$^{\text{h}}$wɔ/	$[\underline{\text{ře}^{\text{h}}\text{wɔ}}]$	'to grind'
"yaa"	/ya/	$[\overline{\text{ya}}]$	'hand'
"'yaah"	/'ya$^{\text{h}}$/	$[\underset{\sim}{\text{ya}^{\text{h}}}]$	'male yak'
"ohso"	/o$^{\text{h}}$so/	$[\underline{^{\text{wh}}\text{o}^{\text{h}}\text{so}}]$	'like that'

c) Any vowel can be breathy:

"tihwa"	/ti$^{\text{h}}$wɔ/	$[\underline{\underset{\wedge}{\text{t}}\text{i}^{\text{h}}\text{wɔ}}]$	'to stammer'
"tehwa"	/te$^{\text{h}}$wɔ/	$[\underline{\underset{\wedge}{\text{t}}\text{e}^{\text{h}}\text{wɔ}}]$	'to drive away'
"taahwa"	/ta$^{\text{h}}$wɔ/	$[\underline{\underset{\wedge}{\text{t}}\text{a}^{\text{h}}\text{wɔ}}]$	'to hit'
"tuhwa"	/tu$^{\text{h}}$wɔ/	$[\underline{\underset{\wedge}{\text{t}}\text{u}^{\text{h}}\text{wɔ}}]$	'tired'
"tohwa"	/to$^{\text{h}}$wɔ/	$[\underline{\underset{\wedge}{\text{t}}\text{o}^{\text{h}}\text{wɔ}}]$	'to meet'
"tahna"	/tɔ$^{\text{h}}$nɔ/	$[\underline{\underset{\wedge}{\text{t}}\text{ɔ}^{\text{h}}\text{nɔ}}]$	'many'

d) Breathy vowels occur in all of the six emic syllable types:

CV	"koh"	/ko$^{\text{h}}$/	'shoulder'
CVC	"kehn"	/ke$^{\text{h}}$n/	'bread'
CCV	"'praah"	/'pra$^{\text{h}}$/	'flour'
CCVC	"pruhp"	/pru$^{\text{h}}$p/	'to write'
V	"eh'lawa"	/e$^{\text{h}}$'lɔwɔ/	'to dress up'
VC	"ihnlaase"	/i$^{\text{h}}$nlase/	'may be'

B. Pitch.

At the present stage of the research we have not yet been able to classify clear monosyllabic nouns and particles. The clear monosyllabic items in the examples below are verb stems.

1. Contrast.

In the preceding section on voice quality we have seen that low pitch is conditioned by breathiness and high pitch by the absence of breathiness on vowels. But within both groups we have a further contrast between level and contour pitches.

In clear morphemes, the contour pitch is a falling one, which starts a little higher than the level pitch with which it contrasts. The fall stretches over one or two syllables. On the third it is level:

[ṭo]	'to roast'
[ṭowɔ]	'roasting'
[ṭowɔři]	'in order to roast'

With level it is as following:

[nã]	'to carry'
[nãwɔ]	'carrying'
[nãwɔři]	'in order to carry'

In breathy morphemes the contour is a rising-falling one which starts on the same height as the level low pitch, rises a good deal and ends in a slight down-glide. The contour stretches over one to three syllables:

[ru^{h}]	'to stir'
[ru^{h}wɔ]	'stirring'
[ru^{h}wɔři]	'in order to stir'

In level it is as following:

[tsu^{h}]	'to cook'
[tsu^{h}wɔ]	'cooking'
[tsu^{h}wɔři]	'in order to cook'

Note:

The illustrations in this section are not to be listened to in isolation, but in frames. For simplification the frames are not given here, but the pitch contours of the examples are given as they would occur in utterances. If the items are pronounced in isolation, the overriding intonation may change the pitch contours.

Minimal contrasts:

[sowɔ]	'hot' (food)	[sowɔ]	'turning round'
[ts^{h}ɔwɔ]	'grazing"	[ts^{h}ɔwɔ]	'feverish, hot'
[syuwɔ]	'to pick vegatable leaves'	[syuwɔ]	'lining up'
[p^{h}yewɔ]	'sorting out'	[p^{h}yewɔ]	'appearing'
[ale]	'younger brother'	[ale]	'money'
[ṱisa]	'food for one meal'	[ṱisa]	'a little'
[tsu^{h}wɔ]	'dividing'	[tsu^{h}wɔ]	'cooking'
[kyo^{h}wɔ]	'ploughing'	[kyo^{h}wɔ]	'beautiful'
[ṭo^{h}wɔ]	'hot' (weather)	[ṭo^{h}wɔ]	'to read a religious book'
[ṱe^{h}wɔ]	'boiling'	[ṱe^{h}wɔ]	'driving away'
[ṭa^{h}ŋ]	'intimate'	[ṭa^{h}ŋ]	'to serve, offer'
[ŋye^{h}]	'liver'	[ŋye^{h}]	'milk'
[ṭi^{h}]	'one'	[ṭi^{h}]	'skin'
[ṭu^{h}]	'six'	[ṭu^{h}]	'grain'

In this section, phonemic contours are marked with /'/ before the first syllable, and the level pitch is not marked.

2. Variation.

For the first syllable of a morpheme we can make the following statement:

/level/	The pitch is high with clear and low with breathy vowels.
/contour/	The pitch is extra high-falling with clear and low-rising-falling with breathy vowels.

The pitch of the second syllable of a morpheme is conditioned by the nature of the first syllable, that is, contours and level pitches spread over both syllables. Therefore, if a disyllabic morpheme is level-breathy, the second syllable has a clear vowel with low pitch.

"me"	/me/	[mẽ]	'to ask'
"pin"	/pin/	[pin]	'to give'
"pulu"	/pulu/	[pulu]	'cap'
"miku"	/miku/	[mǐku]	'smoke'
"'khari"	/'kʰɔri/	[ḳʰɔři]	'idea'
"'cawala"	/'cɔwɔlɔ/	[tsɔwɔlɔ̄]	'food'
"'kaplo"	/'kɔplo/	[ḳɔplo]	'brain'
"pih"	/piʰ/	[piʰ]	'to say'
"lehm"	/leʰm/	[leʰm]	'to lick'
"pahle"	/pɔʰle/	[pɔʰle]	'foot'
"kohca"	/koʰcɔ/	[koʰtsɔ]	'big knife'
"'nuh"	/'nuʰ/	[nṵʰ]	'to sleep'
"'caahng"	/'caʰŋ/	[tsaʰŋ]	'to send'

"'nahma"	/'nɔ^{h}mɔ/	[nɔ̃^{h}mɔ]	'swamp'
"'tuhli"	/'tu^{h}li/	[ṱu^{h}li]	'tailor'

Affixes:

There are also two classes of affixes for pitch: Tonic affixes and atonic affixes. Tonic affixes are those that have their own tone, that is, have either a contrastive 'level' or a 'contour' pitch pattern. Atonic affixes are those that don't have a contrastive pitch classification. The breathy affixes and the clear contour (extra high-falling) affix are tonic, that is, they manifest their own contrastive pitch contours throughout their distribution.

Clear level affixes are atonic, that is, their pitch is conditioned by the stem to which they are affixed as follows:

> The pitch of clear level affixes is low after a level breathy stem, (1-3 affixes) and high after a level clear stem.
>
> The high-falling contour of a clear stem spreads to the first affix, the second and third are level.
>
> The rising-falling contour of a breathy stem spreads over the clear affixes (1-3 affixes).
>
> After a clear level stem the affixes are level as well. More than three level clear affixes in a row have not yet been found.

Atonic affixes on verb stems:

/cu^h/	[tsu^h]	'to cook'
/cu^{h}wɔ/	[tsu^{h}wɔ]	'cooking'
/cu^{h}wɔri/	[tsu^{h}wɔři]	'in order to cook'
/cu^{h}wɔrie/	[tsu^{h}wɔři˂e]	'in order to cook also'
/'pa^h/	[pa^h]	'to bring'
/'pa^{h}wɔ]	[pa^{h}wɔ]	'bringing'

/'pa^{h}wɔri/	[pa^{h}wɔři]	'in order to bring'
/'pa^{h}wɔrie/	[pa^{h}wɔři<e]	'in order to bring also'
/na/	[nã]	'to carry'
/nawɔ/	[nãwɔ]	'carrying'
/nawɔri/	[nãwɔři]	'in order to carry'
/nawɔrie/	[nãwɔři<e]	'in order to carry also'
/'ṭo/	[ṭo]	'to roast'
/'ṭowɔ/	[ṭowɔ]	'roasting'
/'ṭowɔri/	[ṭowɔři]	'in order to roast'
/'ṭowɔrie/	[ṭowɔři<e]	'in order to roast also'

Atonic affixes on nouns:

/ro^{h}/	[ro^{h}]	'friend'
/ro^{h}ri/	[ro^{h}ři]	'to the friend'
/cɔ^{h}cɔ/	[tsɔ^{h}tsɔ]	'child'
/cɔ^{h}cɔri/	[tsɔ^{h}tsɔři]	'to the child'
/'me^{h}/	[mẽ^{h}]	'cow'
/'me^{h}ri/	[mẽ^{h}ři]	'to the cow'
/'cɔ^{h}me/	[tsɔ^{h}mẽ]	'daughter'
/'cɔ^{h}meri/	[tsɔ^{h}mẽři]	'to the daughter'
/kola/	[kola]	'boy'
/kolari/	[kolaři]	'to the boy'
/'polo/	[polo]	'nettle'
/'polori/	[poloři]	'in the nettles'

Tonic affix - breathy: /-caʰ/ 'plural'

/'cɔcɔcaʰ/	[tsɔtsɔtsaʰ]	'salt' (pl.)
/nakacaʰ/	[nakatsaʰ]	'hens'
/'tuʰcaʰ/	[tuʰtsaʰ]	'manure' (pl.)
/'nɔʰmɔcaʰ/	[nɔʰmɔtsaʰ]	'swamps'
/kuʰncaʰ/	[kuʰndzaʰ]	'winters'
/tiʰɳicaʰ/	[tiʰɳitsaʰ]	'suns'

Tonic affixes - clear: /-'cɔm/ 'emphasis'

/-'pre/ 'with'

/'cɔcɔ'cɔm/	[tsɔtsɔtsɔm]	'salt' (emphatic)
/naka'cɔm/	[nakatsɔm]	'hen' (emph.)
/'tuʰ'cɔm/	[tuʰtsɔm]	'manure' (emph.)
/'nɔʰmɔ'cɔm/	[nɔʰmɔtsɔm]	'swamp' (emph.)
/kuʰn'cɔm/	[kuʰndzɔm]	'winter' (emph.)
/tiʰɳi'cɔm/	[tiʰɳitsɔm]	'sun' (emph.)
/peʰ/	[peʰ]	'wife'
/peʰ'pre/	[peʰpre]	'with the wife'
/peʰce/	[peʰtše]	'by the wife'
/peʰce'cɔm/	[peʰtšetsɔm]	'by the wife' (emph.)

Pitch variation under intonation.

The bearing of intonational stress and intonational pitch contours on the lexical pitch has not yet been studied in detail, but some fragmentary statements of the analysis can be made at this point.

a) Up- and downdrift. The phonological sentence is characterized by a general updrift in pitch in the pre-margin and a general down drift in the post-margin.

(Note: In the following, data without brackets is written phonemically except for intonation contours and stress signs.)

pre-margin	peak	post-margin		(The translation in brackets is a word by word translation).
'cu	"tɔyace	'lɔsi	'mumu	'This is made of potatoes.'
/cu	'tɔyaçe	'lɔsi	'mumu./	(this potatoe-from made is)
'cu	"kolace	'lɔsi	'mumu	'A boy made this.'
/cu	kolace	'lɔsi	'mumu./	(this boy-by made is)
'cu	"ṭu^{h}ce	'lɔsi	'mumu	'This is made of grains.'
/cu	ṭu^{h}ce	'lɔsi	'mumu./	(this grain-from made is)
'cu	"me^{h}ce	'pa^{h}si	'mumu	'A cow brought this.'
/cu	'me^{h}ce	'pa^{h}si	'mumu	(this cow-by brought is)
'ŋɔce	'curi	"poloca^h	'mraŋci	'I saw nettles here.'
/ŋɔce	curi	'poloca^h	'mraŋci./	(I-by here nettles saw)
'ŋɔce	'curi	"nɔṭica^h	'mraŋci	'I saw bones here.'
/ŋɔce	curi	nɔṭica^h	mraŋci./	(I-by here bones saw)

b) Intonational stress contours on affixes. Some intonation patterns are characterized by heavy stress with rising or falling pitch or a level decrescendo on the last syllable of the phonological sentence. Clear level affixes in this position are no longer under the influence of the pitch of the stem, but take over the intonation features. The resulting pitch contours are not relevant on the syllable or morpheme level. On the sentence level they signal contrastive intonation patterns and can be symbolized by different punctuation marks.

/-ci/ 'past tense affix' - under the influence of the stem:

'tiɳi 't^{h}ece 'cɔci 'mu ro	'Today he had eaten, they said'
/'tiɳi t^{h}ece 'cɔci mu ro./	(today he-by eat is reported speech particle)
'tiɳi 't^{h}ece 'cu^{h}ci 'mu ro	'Today he had cooked, they said.'
/'tiɳi t^{h}ece cu^{h}ci mu ro./	(today he-by cooked reported speech particle)

Under the influence of intonation pattern:

't^{h}ece 'ṭosi 'cɔci	'When he had roasted it, he ate.'
/t^{h}ece 'ṭosi 'cɔci./	(he-by roasted eat)
't^{h}ece 'yesi 'cu^{h}ci	'When he had returned, he cooked.'
/t^{h}ece 'yesi cu^{h}ci./	(he-by returned cooked)

/-wɔ/ 'present indefinite tense affix' - under the influence of the stem:

'tiɳi 'ɳɔce 'cu^{h}wɔ 'i^{h}mu	'Today I am cooking.'
/'tiɳi ɳɔce cu^{h}wɔ i^{h}mu./	(today I-by cooking am)

Under the influence of intonation:

'tiɳi 'kya^{h}ɳce 'cu^{h}wɔ	'Are you cooking today?'
/?'tiɳi 'kya^{h}ɳce cu^{h}wɔ?/	(today you-by cooking)
'cu^{h}wɔ 'tiɳi 'ɳɔce 'cu^{h}wɔkɔ	'Yes, I am going to cook today.'
/cu^{h}wɔ. 'tiɳi ɳɔce cu^{h}wɔkɔ./	(Cooking. Today I-by will-cook)

C. Tone versus stress.

The analysis given thus far takes the basic contrasts of the system to be clear versus breathy and contour versus level pitch.

	contour	level
clear	extra high-falling /'/	high /#/ (not marked)
breathy	low-rising-falling /'/ + /h/ after vowel	low /#/ only /h/ after vowel

Why tone and not stress?

In the earlier stages of the analysis we had been talking of a primary versus secondary stress contrast instead of a pitch contrast, because in the pattern in which we met the contrast first, it can be heard as a stress contrast. This is exemplified by the following:

"cu^{h}wɔ	'cooking'
'cu^{h}wɔ	'dividing'
"sowɔ	'hot' (food)
'sowɔ	'turning round'

As we went on investigating with other frames and patterns it was very difficult to hear and decide on stress differences, but the pitch contrast remained fairly constant. If the analysis had been carried out in terms of stress, primary and secondary stress would always have had to be described in terms of level pitches and contours. We therefore prefer to talk about a tone system at the present stage of research.

PITCH, INTENSITY, AND HIGHER LEVELS IN CHEPANG

Ross Caughley

[The perameters of pitch and intensity which are described for other languages as manifestations of contrastive tone are described for Chepang as manifestations of the segmental structure of Chepang syllables. In general, voiceless consonants in syllable-final position raise the relative pitch of the syllable and increase its relative intensity. Variation in one of these syllable-final voiceless stops (the glottal stop /ʔ/) is such as to make it possible to conclude that in some instances the conditioning environment disappears entirely. This might lead one to conclude that, at least in certain environments, pitch and/or intensity are contrastive. Chepang has thus been viewed as an incipient tone language.

The current analysis views these otherwise contrastive pitch/intensity characteristics as variant manifestations of the glottal stop. Following Caughley (1969), these variants were described in 'Chepang Segmental Synopsis', elsewhere in this report, as manifested primarily by pitch. In the following excerpts from Caughley's latest revision of his phonemic summary, these variants are described as manifested primarily by relative intensity distribution across the syllable. Included here are the sections on Glottal Stop, The Syllable, The Foot, and The Phrase.]

I. Higher Levels.

A. The Syllable.

The syllable is regarded here as a group of segments, the most prominent of these being the nucleus, while the others constitute the pre-nuclear and post-nuclear margins. Under this view the time occupied by each margin is approximately equal to that taken by the nucleus. Therefore the greater the number of segments there is in a margin, the shorter each individual segment becomes.

Syllable boundaries are most easily determined segmentally because of the various restrictions on the distribution and clustering of marginal consonants. An additional indication of boundary position is that it is a nodal or minimum point for intensity and pitch. This latter indication is useful when there are alternative ways of dividing a foot-medial consonant cluster. For instance in the medial cluster CC', where C is /p/, /k/, or /s/ and C' is /r/, /y/, or /w/, the syllable break could come either before or after C. An example:

/kə.sya?/, not /kəs.ya?/ for 'barking deer'.

1. Contrast.

The syllable consists of an obligatory initial margin and nucleus, plus an optional final margin. Each margin may have up to three segments. This may be shown thus: (C)(C)CV(C)(C)(C), where () encloses optional items.

There are, therefore, twelve possible contrasting syllables, though only ten of these have been found. Examples are:

1. CV

/la/ 'rope'; /to/ 'father-in-law'; /gu/ 'a root'

2. CVC

/pak/'sole; /pən/ 'bed-bug'; /bop/ 'snail'

3. CVCC

/ruyng/ 'bamboo'; /səyk/ 'tooth'; /kəyk/ 'neck'

4. CVCCC

/nəyngh/ 'a shrub'; /məyngʔ/ 'name'

5. CCV

/kru/ 'a measure'; /bri/ 'a net-bag'; /pli.na/ 'be green'

6. CCVC

/krut/ 'hand'; /srək/ 'husk'; /blək.na/ 'skim

7. CCVCC

/srəyk/ 'louse'; /mroyk/ 'twist'; /hwoyng/ 'side of body'

8. CCVCCC

(No examples)

9. CCCV

/mrya.na/ 'be wakeful'; /hryu.na/ 'coil rope'; /jhya.na/ 'beat drum'

10. CCCVC

/bryok/ 'fried maize'; /klyut.na/ 'extract'; /gryang/ 'a big basket'

11. CCCVCC

/kryongʔ/ 'knee'; /glyungh.na/ 'descend'; /mryangh.na/ 'echo'

12. CCCVCCC

(No examples)

2. Variation.

(a) Segmental Variation

The distribution and co-occurrence restrictions of consonants in the syllable margin is shown in the chart below.

	Pre-Nuclear Margin					Nucleus	Post-Nuclear Margin		
Col. No. / Row No.	I	II	III	IV	V		VI	VII	VIII
1	k	h				i			k
2	g				w	e			
3	p					a			p
4	b			l		u			t
5	s					o			s
6			m					m	
7			ng	r					
8	t		n					n	
9	d							r	
10	c							l	
11	j							w	
12		h			y		y	ng	h
13			ʔ						ʔ

Rule for Generating Margin Clusters.

To form the initial or final margin take (optionally) one segment from each column of the above chart in the order given, and subject to the following restrictions: (Note these only apply within a margin, not across the nucleus.)

1. A segment in a row of given number cannot be followed by another whose row is of a lower numerical order. So /p/ (Row 3) can be followed by /l/ (Row 4), but not by /w/ (Row 2), which is higher in the chart. Since /h/ occurs twice in Col. II, it can co-occur with any other segment allowed by restrictions 2-5 below.

2. A segment from Col. I cannot co-occur with any segment from Col. III, or with segments from both Col. II and Col. IV.

3. /s/ cannot co-occur with /h/, /l/.
/ng/ cannot co-occur with /r/. /y/.

4. These do occur in the Initial Margin: /ghr/, /bhry/.
Final Margin: /yk/.

5. These do not occur (I.M.): /khw/, /khy/, /ghw/, /ghy/, /hmr/, /hmy/, /sry/. (F.M.): /yngh/.

(b) Boundary Variation

If two stressed syllables are contiguous there is a tendency to equalize the number of segments in each. For example, what is normally the final margin of a longer syllable (identified as a morpheme), becomes part of the initial margin of a following shorter syllable when the two are equally stressed. Because each stressed syllable is also a foot, the isochronic nature of the foot unit no doubt is responsible for this change. E.g.,

[dɔηə] /ˈdo.ˈηə/ 'point!' (but morphemically it is /ˈdoη.ˀə/.)

Since one of the variants of glottal is a marked syllable boundary, such a change causes the position of the glottal to change also, as illustrated:

[ˈdɔηə] /ˈdoˀ.ˈηə/ 'end!'. But the morpheme is usually /doηˀ/.

(c) Suprasegmental Variation

The suprasegmental variation of the syllable is discussed in the section on this subject below.

3. Distribution

As ten contrasting syllable types have been noted there are a hundred possible combinations of these ten types in a two-syllable foot. No attempt has been made to collect examples of each of these, but no restrictions on possible combinations have been noticed.

What is more interesting, however, is the combination of syllables classified according to voicing, or lack of it, in the margins, since it is this that most affects syllable intensity and pitch. In this case there are sixteen possible combinations (four for each syllable) and all of these occur. Writing a voiceless margin as 'C' and a voiced one as 'c' the combinations are:

1. C-C.c-c 2. C-C.C-c 3. C-C.c-C 4. C-C.C-C

5. c-C.c-c 6. c-C.C-c 7. c-C.c-C 8. c-C.C-C

9. c-c.c-c 10. c-c.C-c 11. c-c.c-C 12. c-c.C-C

13. C-c.c-c 14. C-c.C-c 15. C-c.c-C 16. C-c.C-C

Examples of each of these are:

1.	[ta^k.řɔ]	/tak.ro/	'a flower'
2.	['tʊk.pʊn]	/tuk.pun/	'stomach'
3.	['tɔ't.mʊh]	/tot.muh/	'a fungus'
4.	[šik̭.kɔˇs]	/sik.kos/	'a grain'
5.	[šɪp.řu]	/sip.ru/	'a snake'
6.	[wa^k.ti]	/wak.ti/	'splitting'
7.	[wa^k.lʊk]	/wak.luk/	'a vine fruit'
8.	[nɛk.ma]	/nek.ma/	'this year also'
9.	[ba^ŋ.ləm]	/bang.ləm/	'stones'
10.	[ba^ŋ.taŋ]	/bang.tang/	'stone place'
11.	[yæm.rɔˇḳ]	/yam.rok/	'husk'
12.	lyʊ˂m.pʰʊḳ]	/lyum.phuk/	'cave'
13.	[kɪm.ləˇm]	/kim.ləm/	'houses'
14.	['tɔˇ'n.ṱi]	/ton.ti/	'falling'
15.	[kɔˇŋ.rɔˇḳ]	/kong.rok/	'a black ant'
16.	[lɛˀ.'tɔˇḳ]	/leˀ.tok/	'when buying'

Note: In the following sections minor variations are not shown in the phonetic examples. The symbols '<' and '>' represent 'crescendo' and 'decrescendo' respectively and should not be confused with fronting and backing of vowel position.

B. The Foot.

The foot in Chepang is basically a timing unit with stress on the initial syllable and an overall decrescendo to the margin of the last syllable. The stressed syllables of each foot are approximately equally spaced in time.

1. Contrast

No contrasting types of feet with respect to stress placement have been noted though no systematic investigation of this has been carried out to date. The structure of a foot is, therefore, a nuclear stressed syllable followed by an optional margin of up to three (possibly more) unstressed syllables.

Examples are given below, with foot stress marked by ''', phrase stress by '"', and syllable boundary by '.'. Note that each stress mark indicates the start of a new foot.

['ŋay.'pay "khay.'dhaŋ.ŋa.'lə] /'ŋay.'pay "khay.dhaŋ.ŋa.'lə/ 'I am not yet finished.'

['Rɔk.s$\overset{>}{a}$.'gɔ$\overset{>}{y}$.$\overset{<}{i}$'?$\overset{>}{a}$l.ma.$\overset{<}{u}$.lu 'ya.$\overset{<}{a}$ "tup.kru ?$\overset{<}{a}\overset{>}{l}$.ya '?a$\overset{>}{l}$.nəw] /'hrok.sa?'goy?.?i '?al?.ma.?u.lu 'ya.a "tup.kru ?al?.ya ?al?.nəw/ 'White earth yam does not go down more than a cubit.'

["pe.$\overset{<}{o}$ŋ.lem.'na.rəy.sə] /"pe.?o.lem.'na rəy.sə/ 'There is a good place.'

In the last example the morphemes of the first foot are "pe-?o-ha -le? mu-", but because of the timing, the margin morphemes are compressed into two phonetic syllables.

2. Variation

The only non-contrastive features of the foot discussed in this section are those of stress and pitch patterns over the foot. Though both of these involve suprasegmentals, they are described in this section. The first, stress pattern, is included here because it involves the combination of syllables in a higher unit, the foot. The second, pitch pattern, is included because it is related to the distribution of feet in a still higher level, the phonological phrase.

(a) Stress pattern

As mentioned in the section on syllable distribution, if syllables are classified according to voicing or lack of it in the margins, any combination of syllable types can occur in a two-syllable foot.

The types of syllables that occur in the first two positions in a foot affect the distribution in the following ways:

If there is a break in voicing between the first (stressed) syllable and the second, then stress is restricted to the first syllable and not shared with the second. Thus there is a strong contrast in stress between the two syllables. This is true of both '-C.c-' and '-c.C-' combinations. Examples are:

['kap.ma.kan]	/'kap.ma.kan/	'also mend'
['jan.ti]	/'jan.ti/	'scolding'
['ka.ma.kan]	/ka?.ma.kan/	'also transplanted'

If there is no break in voicing, then foot stress tends to be shared over the first two syllables. The degree of stress on either syllable appears to be less than it is on the single stressed syllable of the first case. Examples are:

['jan.ma .kan]	/'jan.ma.kan/	'also scolded'
['ka.ma.kan']	/'ka.ma.kan/	'also put in'

(b) Pitch pattern

Along with the even timing of stress on feet there is usually an overall pitch pattern which varies according to the position of the foot in the phonological phrase.

For phrase initial and medial positions this takes the form of a slight rising and falling pitch over each foot. There is usually one pitch peak or trough per foot, as indicated in the following examples:

["syæŋ̊.pay 'gɔ>y.dyaw> '<al.cə] /"syæŋh.pay 'goy?.dyaw? ?al.cə/ 'Let us go yam-digging tomorrow.'

['?a.nə'tɔm.na Rɔk.sa? 'goy] /'?a.nətom.na hrok.sa? goy?/ 'Very good white earth yam'

Note that for the phrase final foot there is a uniformly rising, falling or level pitch.

If a foot is the stressed one of an Emphasis phrase this rise and fall pattern is greatly exaggerated on that foot (see the section on the Phonological Phrase below).

3. Distribution

No restrictions on the distribution of feet have been noted, though the last foot of a phrase is usually no longer than one or two syllables.

C. The Phonological Phrase

Little study has been done on this level. However, some of the properties that have been noted are discussed here.

The phonological phrase is a group of feet consisting of one phrase-stressed nuclear foot and optional initial and final margins consisting of one or more feet without phrase stress. The maximum number of possible feet in a margin has not been determined.

1. Contrast

Two contrasting phrase types that occur sentence medially are:

(a) Normal phonological phrase with the rise and fall pitch pattern discussed in the section on foot variation.

["ka?.cə.raŋ 'mu.na] /"ka?.cə.raŋ 'mu.na/ 'It is a new place.'

(b) Emphasized phrase, in which the rise and fall is greatly exaggerated on the stressed foot. Lengthening of syllables occurs along with the increase in pitch.

["ka?:.c:ə.raŋ 'mu.na] /"ka?.cə.raŋ 'mu.na/ 'It is a new place.'

2. Variation

In a phonological sentence medial phrase the last foot has a rising pitch (as can be seen in the examples above.)

In a sentence final phrase there is a pitch fall from the stressed foot to the last one, usually accompanied by a decrescendo.

['?ɔ.haŋ.'pay '?al.le˃.c̄ə̄ "goy˃.dyaw˃.l̄āŋ.'p̄āy]

/?o.haŋ.pay '?al.le?.cə "goy?.dyaw.laŋ.'pay/

'Let us go there to dig yam.'

The first phrase of a following phrase begins on a high level to retrieve the pitch.

3. Distribution

The distribution of phrases in the phonological sentence has not been studied yet.

II. Suprasegmental Features and Glottal

In this section suprasegmental features of the syllable are discussed, together with some of the manifestations of phonemic glottal stop.

Although such suprasegmental features are not regarded as phonemic under the present interpretation, they are presented here in a separate section, parallel to those languages in which they are phonemic. Glottal is included because in many instances its overt manifestation is suprasegmental and, under another interpretation, phonetic glottal stop could be regarded as a manifestation of a suprasegmental phoneme instead of the reverse as adopted here.

A. Suprasegmentals in relation to syllable segments.

1. Intensity

The constituent consonants of the syllable margins have an appreciable effect on the intensity (more strictly the 'perceived intensity') distribution over the whole syllable. This is not too surprising in view of the difference in articulation between, say, a voiceless stop and a voiced sonant. The final margin appears to have a greater influence on the intensity shape than the initial margin and hence is dealt with more fully below. Five classes of (final) margin constituents, and their resulting effects are:

(a) Voiceless Stop: A syllable with a voiceless stop as the final margin has a very sharp cut-off (or decrescendo) after the nucleus. Similarly a voiceless stop in the initial margin results in a rapid build-up in intensity (or crescendo) to the syllable nucleus.

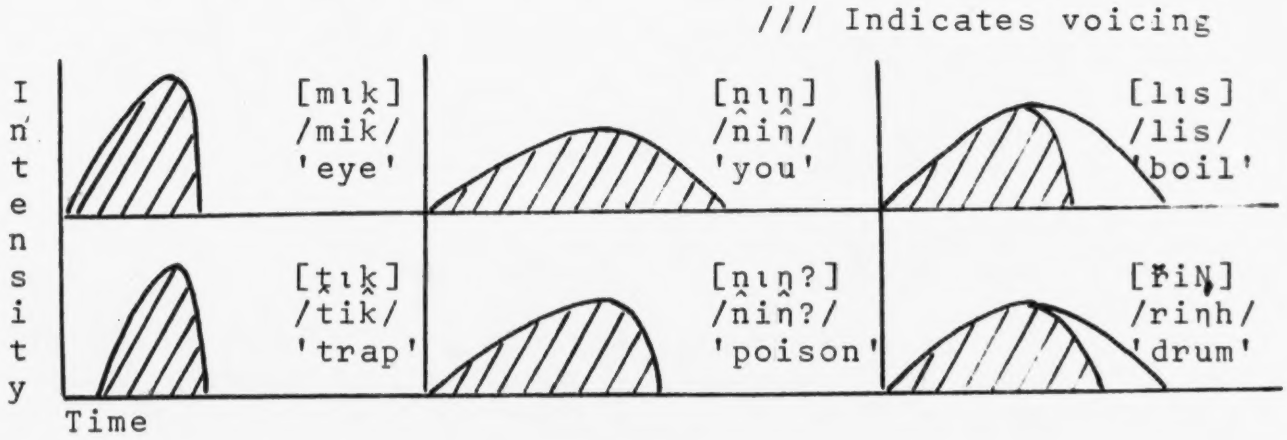
(b) Sonant: A syllable with a (voiced) sonant as the final margin on the other hand has a much slower decrease in intensity.

(c) Fricative: The effect of a fricative /h/ or /s/ is to give a relatively sharp cut-off of voiced intensity as with a stop, but the intensity of the voiceless friction decreases more slowly, as is the case with a sonant.

(d) Sonant-stop Cluster: A sonant-stop cluster gives a shape similar to that of a single stop but the nucleus appears to be slightly longer.

(e) Sonant-fricative Cluster: A sonant-fricative cluster has an effect similar to that of a fricative alone, though again the nucleus is somewhat longer.

The five types can be illustrated by plotting intensity against time, with the time zero the end of a frame syllable. A sixth type with voiceless initial margin is also shown.



The total 'energy' of a syllable appears to be relatively independent of syllable length. Thus an abrupt syllable, such as /tik/ above, is perceived as having a higher maximum intensity or greater stress than a longer syllable, such as /niŋ/.

2. Pitch

The pitch shape of a syllable tends to be similar to the shape of voiced intensity. However, a sharp change in intensity often masks the accompanying pitch change. So a syllable with a voiceless final margin gives the impression of an up-glide (if the initial margin is voiced) or a high, relatively level pitch (if the initial margin is voiceless). For example:

[mɪk̭] /mik/ 'eye'; [ṱɪk̭] /tik/ 'trap'; [ṋɪŋ̭]

/niŋ/ 'you'.

B. Glottal Stop.

As mentioned above, phonetic glottal stop could be regarded as a manifestation of phonemic (intensity) tone. This view is not taken here because when the full glottal stop is present it is phonetically similar to other voiceless stops as regards length and moreover it effects syllable intensity and pitch in almost exactly the same as any other voiceless stop. When a phonemic glottal is not manifested by a phonetic glottal stop the intensity shape (that of a syllable with a final voiceless stop) remains, indicating the presence of phonemic glottal. An example is:

['ka.ma.kan]	/ka?.ma.kan/	'also transplanted'

Compare this with:

['kap.ma.kan]	/kap.ma.kan/	'also mended'
['ka.ma.kan]	/ka.ma.kan/	'also put in'

It seems more reasonable to assume therefore, that there is a phonemic glottal, which sometimes lacks complete glottal closure than that there is a phonemic intensity shape, (identical to that of stop terminated syllables, but occurring only on open syllables) which is sometimes manifested as a phonetic glottal stop.

Note that neither segmental nor morphemic environment determine which manifestation of glottal will occur. For instance a sentence containing a glottal terminated syllable was repeated three times per utterance. In one utterance three variants, phonetic glottal stop, decrescendo, decrescendo with slight laryngealization (indicated by˜), were found. In a second utterance only one variant, phonetic glottal occurred.

First utterance:

['la.ma 'la?.ma mu.na]	/'la.ma 'la?.ma mu.na/	'There is a rope and an arrow!'
['la.ma 'la.ma mu.na]	/'la.ma 'la?.ma mu.na/	
['la.ma 'la˜ma mu.na]	/'la.ma 'la?.ma mu.na/	

Second utterance:

['la.ma 'la?.ma mu.na]	/'la.ma 'la?.ma mu.na/	'There is a rope and an arrow.'

(Repeated three times).

Instead of speaking in terms of 'intensity shape' this manifestation could be discussed in terms of 'syllable border.' Since syllable borders are indicated by some degree of re-articulation initially and decrescendo finally, the marked change in intensity due to phonemic initial or final glottal tends to make the syllable borders much clearer. This is particularly true of a syllable final glottal as in the examples /ka?.ma.kan/ and /ka.ma.kan/ above. For an initial phonemic glottal the border may be no clearer than it is for other syllables. However a phonetic glottal has been observed only before a vowel, never before another consonant. Assuming that an initial margin must be present on every Chepang syllable, if no other consonant occurs as an initial margin then a phonemic glottal is present. This assumption is supported by the fact that in many instances a phonetic glottal does indeed occur.

To sum up then, under the present analysis Chepang has a phonemic glottal which, however, is not always manifested phonetically as a true stop. In such cases its presence is detected by intensity changes at the syllable border, or to put it another way, by the distinctness of the syllable boundary, in a way that is characteristic of a voiceless stop margin.

Thus Chepang, while not regarded as a true tonal language itself does have affinities with tonal languages. It is interesting too, that the Chepangs have a form of whistle communication in which the whistle pitch is related to the segments of words whistled, in a way that is similar to the relationship between segments, and pitch and intensity described above.

NEWARI HIGHER LEVELS

Austin Hale

[According to the current analysis, Newari lacks contrastive pitch, contrastive breathiness, and contrastive stress. The question to be answered is "How is Newari related to its neighboring languages with respect to what we have called 'tone systems'?"

To say simply that Newari is not a tone language is not an entirely satisfying answer in this case. As may be seen from the Newari segmental synopsis, phonetically breathy vowels do occur following voiced aspirated consonants. This analysis views aspiration as clustering with /h/, and /h/ is seen to cluster with all consonants except /s/. Another, less symmetrical interpretation of the same phonetic data could be made. One could say that there is a series of voiceless aspirates. Following voiceless consonants, all vowels are clear. One could then say that breathy vowels contrast with clear vowels following voiced consonants and that there is no series of voiced aspirates. In this manner we could account for the same phonetic facts accounted for by the present analysis and at the same time make the consonantal system of Newari look much more like that of Gurung than it does on the present interpretation. The pitch effects of breathiness in Newari, however, are not as consistent or systematic as those in Gurung. Pitch in Newari is controlled primarily by intonation. This reinterpretation of segmentals in Newari would probably not qualify Newari for recognition as a tone language.

Another approach to the search for phonological parallels may prove more fruitful. In Newari, not all syllables in poly-syllabic words have the same prominence. It has not, however, been possible to find contrasts in stress or prominence between poly-syllabic words with the same segmental representation. Work currently in progress supports the view that relative syllable prominence within a word is a function of certain general rules of stress which take account of such factors as relative position of the syllable within a word, and the segmental composition of syllables. Stress within the word appears to be predictable, given the segmental representation. (The only aspect of relative syllabic prominence in Newari treated here is that which is found under (2c) 'length rank' below. A fuller account is in preparation.) This view of Newari finds interesting parallels in recent work on both Chepang and eastern Tamang. In both of these languages, rules have been written in which certain noncontrastive pitch or prominence patterns are predicted in terms of weightings assigned to segment types and syllable patterns. In Chepang whistle talk, most pitch heights and contours can be predicted in terms of the segmentals underlying the whistled utterance. Syllable prominence in Newari may thus be related to similar systems in Chepang (which may be viewed as an incipient tone language) and in eastern Tamang (a language that makes clear use of contrastive pitch). Further work may show other parallels. The following is a somewhat revised version of the final section of Hale (1969).]

I. Higher Levels.

A. The Syllable. By all odds the consonant initial (C or CC) open syllable (V, VV, or VVV) is the favorite pattern for Newari. In only very few words such as "byykh" 'poison' and "ta:ryph" 'praise', both loans, are final CC-clusters to be found [though syllable-reduction in rapid speech such as "cydh-ma" < "cydhy-ma" 'step-mother' yields some rapid speech forms of this shape]. No examples of VVVC have been found to date and only two each have been found of CCVVC and CCVVVC patterns. Syllable boundary is marked in three kinds of cases: (1) to distinguish nasalized vowel "an'" from the VC-sequence "an", (2) to distinguish the coalescing clusters "ay'" and "ay:" from the disyllabic clusters, "ay" and "a:y", and (3) to render unambiguous sequences of three or more vowels which without syllabification could be understood in more than one way such as the verb "w'yay'" 'cremate' (1F). Otherwise syllabification is by rule: (1) "a" and "a:" are syllable final except in "ay'" and "ay:", (2) Word-medial CC-clusters of the form C + "h" or Stop + "d" are syllable-initial, (3) Other sequences of two C's intervocalically are separated by syllable boundary, and (4) A single C intervocalically is syllable-initial. As has been noted in the previous section, this analysis has not been justified on the basis of suspect and non-suspect CV patterns. It may therefore require some reinterpretation on the part of those who require this kind of justification.

1. Contrast.

Excluding the rare word-final CC mentioned above, Newari has the following contrastive syllable patterns.

	Initial-V	Initial-C	Initial-CC
a.	V	CV	CCV
b.	VC	CVC	CCVC
c.	VV	CVV	CCVV
d.	VVC	CVVC	CCVVC
e.	VVV	CVVV	CCVVV
f.	*VVVC	CVVVC	CCVVVC

*no examples to date

Initial-V Syllables   a. V

"an'"	/ə̃/	'mango'
"ylya"	/iliə/	'time' (L)
"khay"	/khə.i/	'spit'
"naw"	/nə.u/	'barber'
"athyan'"	/əthiə̃/	'like that, so'

b. VC

"alsy"	/əlsi/	'lazy'
"appa:"	/əppa/	'brick'
"wlta:"	/ulta/	'opposite'
"agty"	/əgti/	'ghost'

c. VV

"aa:"	/aa/	'there, now'
"yyn'"	/ĩĩ/	'sickle'
"wa"	/uə/	'that'
"ww-gw"	/uu-gu/	'cremate' (PfII)
"yala"	/iələ/	'Patan'

	d. VVC	
"yakkwa"	/iəkkuə/	'much, many'
"la:waj"	/la.uəj/	'word'
"yanky"	/iənki/	'carry' (FII)
	e. VVV	
"yayn'"	/iə̃ĩ/	'Kathmandu'
"way'"	/uəi/	'cremate' (FI)
"yaa:"	/iaa/	'do!' (Impv)
"way:"	/uai./	'paddy' (L)
	f. VVVC	
Initial-C Syllables	a. CV	
"pa:"	/pa/	'hatchet'
"pan'"	/pə̃/	'bamboo'
"pa:sa:"	/pasa/	'friend'
"twsy"	/tusi/	'cucumber'
	b. CVC	
"macca:"	/məcca/	'child'
"lappa:"	/ləppa/	'arm'
"dykka"	/dikk ə/	'sad'
"swdty"	/sudty/	'tobacco'
	c. CVV	
"bwa-gw"	/buə-gu/	'fly' (PfII)
"say'n'"	/sə̃ĩ./	'Tibetan'

"kay:"	/kai./	'son'
"haa"	/həə/	'small leaf'
	d. CVVC	
"kaa:l"	/kaal/	'death'
"may'n"	/məi.n/	'beeswax'
"baa:n"	/baan/	'arrow'
"syyt"	/siit/	'dew'
	e. CVVV	
"bway'"	/buəi./	'fly' (FI)
"sway'"	/suəi./	'see' (FI)
"pwaa:"	/puaa/	'hole'
"kway'n'"	/kuə̃ĭ/	'bone'
"myya"	/miiə/	'buffalo'
	f. CVVVC	
"pyaa:j"	/piaaj/	'onion'
"gwaan'j"	/guə̃ə̆j/	'crocodile'
"hwaas"	/huəəs/	'careful'
"jwaad"	/juəəd/	'fever'
Initial-CC Syllables	a. CCV	
"mha"	/mhə/	'body'
"mhwtw"	/mhutu/	'mouth'
"nhy"	/nhi/	'day'
"khw"	/khu/	'lame'

b. CCVC

"phwkka"	/phukkə/	'all'
"dhwnky"	/dhunki/	'finish' (FII)
"kwphat"	/kuphət/	'remedy'

c. CCVV

"chay:"	/chai./	'why?'
"dhay:"	/dhai./	'bug'
"thyy"	/thii/	'gem'
"khywn'"	/khĩũ/	'dark'

d. CCVVC

"khwal"	/khuəl/	'cover'
"pryat"	/priət/	'spirit'
"bhwwt"	/bhuut/	'ghost, python'

e. CCVVV

"lhway'"	/lhuəi./	'vomit' (FI)
"chway'"	/chuəi./	'send' (FI)
"mhwaa"	/mhuəə/	'mohar'
"khwaa:"	/khuaa/	'face'

f. CCVVVC

"khwaad"	/khwəəd/	'jail, trap'
"bhwaag"	/bhwəəg/	'sacrifice'

Odd CC finals:

"byykh"	/biikh/	'poison'

"daa:nkh"	/daankh/	'grape'
"ta:ryph"	/tariph/	'praise'

2. Variation.

The variation of syllable types has certain general features which deserve discussion before we proceed to the matter of the specific sequential constraints on the concatenation of consonants and vowels in clusters. Some vowels are syllabic only in certain environments, others are syllabic in all environments. This aspect of variation is discussed under (a) 'Syllabic Rank', below. Certain vowels produce variation in other vowels in a cluster, others do not. This aspect of variation is discussed in (b) below, 'Assimilative Rank'. Certain segment types contribute more to the perceived length of a syllable than do others. This aspect of variation is discussed under (c) 'Length Rank' below.

a. Syllabic Rank.

Low vowels are always syllabic. A low vowel may be long (geminate) within a syllable, but no two (different) low vowels may occur in a sequence within the same syllable. Except for coalescence and gemination, a low vowel is syllable-final whenever it occurs in an open syllable. Only consonants can follow non-coalescing, non-geminate low vowels within the syllable.

High vowels are syllabic only when they occur in a syllable which has no low vowel. High vowels may be long (geminate) within a syllable, in which case they are syllable final in open syllables. A high vowel may occur with another (different) high vowel in the same syllable or it may precede a low vowel in the syllable. In either case, a non-geminate high vowel initial in a cluster is non-syllabic. It could well be argued that the norm for high vowels is non-syllabic. This consideration, together with the fact that it makes vowel clusters more easily readable has lead to the use of "y" and "w" for high vowels in the orthography.

The high front vowel /i/ differs from its corresponding back vowel /u/ in that it also participates in coalescence following vowels within the syllable. In this position the syllabic rank of /i/ may be considered even lower than when it precedes low vowels: it fronts (and if short, lengthenes) the preceding low vowel, then virtually vanishes. These kinds of considerations allow us to state the following ranking of vowels for syllabicity:

1. Low vowels /a/, /ə/ (always syllabic, thus they are assigned the highest syllabic rank.)

2. The high back vowel /u/ (syllabic after /i/, when geminate and when alone, non-syllavic before any other vowel.)

3. The high front vowel /i/ (syllabic after /u/, when geminate and when alone, non-syllabic before any other vowel, vanishes under fronting and length after low vowels, thus it is assigned the lowest syllabic rank.)

This ranking may be illustrated in terms of the following examples:

1. Syllabic /a/ (always syllabic)

/maa/	[ma:]	'mother'
/ua/	[^{w}a]	'paddy'
/iakənə/	[^{y}ækənə]	'immediately'
/uai./	[^{w}æ:]	'paddy' (L)

2. Syllabic /ə/ (always syllabic)

/uə/	[^{w}ɔ]	'he, she'
/kĩə̃/	[k^{y}ɛ̃]	'curry'
/buəi./	[b^{yw}ɛ:]	'fly' (FI)
/diəə/	[d^{y}ɔ:]	'god'

3. Syllabic /u/ (syllabic when geminate or nucleus-final)

/ciu/	[tš^{y}u]	'tie!' (Impv)
/su/	[ṣu]	'who?'
/huu/	[^{h}ɦu:^{ɦ}]	'angry'

4. Non-syllabic /u/ (glide when pre-nuclear)

/uə/	[ʷɔ]	'he, she'
/suãã/	[ṣʷã:]	'flower'
/ũĩ/	[ʷĩ]	'mad woman'

5. Syllabic /i/ (syllabic when final in a syllable nucleus which has no low vowel and when geminate)

/thii/	[tʰi:]	'gem'
/gũ-i/	[g̣ʷĩ]	'forest' (L)
/si/	[si]	'louse'

6. Non-syllabic /i/ (when pre-nuclear)

/lia/	[lʸa]/[lʸæ]	'amount'
/piəə/	[pʸɔ̃:]/[pʸɛŋ]	'hip'
/miiə/	[mʸe:]	'buffalo'

7. Coalescing /i/ (when post-nuclear)

/gai./	[gæ:]	'shawl' (L)
/bhai./	[bʱæ:ʱ]	'language'
/ləəi./	[lɛ̃:]	'road' (L)
/bhuəi./	[bʱywɛ:ʱ]	'banquet'

b. Assimilative Rank.

Low vowels appear to have no effect upon the quality of the vowels with which they concatenate within the syllable. The high back vowel /u/ has a rounding and backing effect upon a following /ə/ or /əə/. It has no apparent effect upon a following /a/ or /aa/. The high front vowel /i/ has a fronting effect upon /a/ in non-final syllables of a word and upon /ə/ everywhere. The high front vowel has a fronting and lengthening effect upon a preceding /ə/ or /a/ and a fronting effect upon a preceding /əə/ or /aa/. We may state these facts in terms of a ranking of vowels for assimilative potential as follows.

1. The high vowel /i/ fronts (and if short lengthens) a preceding low vowel /a/ or /ə/ within the syllable. It also fronts a following low vowel within the syllable (fronting of /a/ is optional in word-final open syllables). /i/ is thus assigned the highest assimilative rank.

/mhiai./	[m^{ɦ}yæ:^{ɦ}]	'daughter'
/ləəi./	[lɛ̃:]	'road' (L)
/iakənə/	[^{y}ækənə]	'immediately'

2. The high vowel /u/ has a rounding and backing effect upon a following /ə/. It is thus assigned the second assimilative rank.

/uə/	[^{w}ɔ]	'he, she'
/mhuəə/	[m^{ɦw}o:^{ɦ}]	'mohar'

3. The low vowels /ə/ and /a/ have no obvious qualitative effect upon other vowels in the same syllable. The alternation [u]/[^{w}] has to do with syllabicity, not quality. The low vowels are thus assigned the lowest assimilative rank.

/ua/	[^{w}a]	'tooth'
/khuaa/	[k^{hw}a:]	'face'
/iaa/	[^{y}a:]	'do!' (Impv)
/[illegible] i/	[[illegible].i]	'suffer loss' (FII)

c. Length Rank.

Certain segment types contribute more to perceived syllable length than do others. Among the vowels we may distinguish the following ranking in order from long to short.

1. /a/
2. /ə/
3. syllabic /i/, /u/, coalescing /i/.
4. non-syllabic /i/, /u/.

A vowel of rank (2) followed by a vowel of rank (4) yields a sequence roughly equal in length to a vowel of rank (1).

/ka/	[ka]	'thread'
/kĭə̃/	[k^{y}ɛ̃]	'curry'

Among the consonants the following approximate ranking has been noted (from long to short).

1. nasal and lateral sonants.
2. fricatives.
3. voiced aspirates.
4. voiceless aspirates.

Total syllable length is, however, subject to modification by patterns of stress and rhythm within the stress group. Length is best observed under the substitution in a frame such as the following:

/ənə___ du la/ 'Is there (a) ____?'

3. Distribution.

For the present purposes we will discuss the distribution of four types of syllables.

a. V-syllables (Type-1)

b. VC-syllables (Type-2)

c. CV-syllables (Type3)

d. CVC-syllables (Type-4)

where V covers a string of from one to three vowels and C covers a string of from one to two consonants. Under 1.'Contrast' above we have seen that Newari has monosyllabic words of each type. In this section we will be concerned with the distribution of these syllable types within the word. The following chart summarizes the distribution in disyllabic words:

	<== Second Syllable ==>			
First Syllable	V (1)	VC (2)	CV (3)	CVC (4)
V (1)	"ya:y" /ia.i/ 'do'(FIII)	"a:wl" /aul/ 'malaria'	"ymw" /imu/ 'ant'	"yna:m" /inam/ 'prize'
VC (2)	not possible	not possible	"alsy" /əlsi/ 'lazy'	"akkal" /əkkəl/ 'trick'
CV (3)	"naw" /nə.u/ 'barber'	"la:waj" /la.uəj/ 'word'	"hyda:" /hida/ 'diamond'	"kwsal" /kusal/ 'safe'
CVC (4)	not possible	not possible	"malta:" /məlta/ 'chili'	"cappal" /cəppəl/ 'sandal'

Clearly the major disyllabic patterns are CV.CV (3-3), CVC.CV (4-3), and CV.V (3-1). The minor patterns include V.CV (1-3), VC.CV (2-3), and V.V (1-1). The remaining patterns with closed final syllables may be viewed as loan patterns.

SUNWAR TONE AND HIGHER LEVELS

Dora Bieri and Marlene Schulze

[The analysis of the Sunwar tone system given here is a tentative one. At very least, there is a contrast between high and low pitch. On long vowels there is an additional contrast between level and falling, both for high and for low pitch syllables. That falling pitch contours are heard only on long vowels is suspicious, and may indicate that a revision of the analysis of syllable patterns is called for, and that a three-tone system is required for the description of tone. Further work is needed to establish a definitive analysis. The following sections are taken from Bieri and Schulze (1969). They serve to specify the tone analysis that underlies the transcription used in the Sunwar texts.]

I. Higher Levels.

A. Syllable.

1. Contrast.

The ten syllable types contrast as:

1. CV
2. CVV
3. CCV
4. CCVV
5. CVC
6. CVVC
7. CCVC
8. CCVVC
9. CVCC
10. CCVCC

a. Syllable type 1: CV

"po"	/pò/	'pig'
"'bi"	/bí/	'cow'
"ka"	/kà/	'one'
"wa:"	/wɑ̀/	'cloth'

b. Syllable type 2: CVV

""bee-tsa"	/'bée-ca/	'to die'

""tsii-tsa"	/'cíi-ca/	'to wash the body'
""tsoo-tsa"	/'cóo-ca/	'to shut in'
"=naa-tsa"	/'nàa-ca/	'to weigh'

c. Syllable type 3: CCV

"gru-tsa"	/grù-ca/	'to appear'
"bre-tsa"	/brè-ca/	'to fall down'
"'gye-tsa"	/gyé-ca/	'to get thin'
"glo"	/glò/	'horn'

d. Syllable type 4: CCVV

"=prii-tsa"	/'prìi-ca/	'to fill it'
"=brii-tsa"	/'brìi-ca/	'it fills'
""shyee-tsa"	/'šyée-ca/	'to teach'
""phle;e-tsa"	/'pʰlée-ca/	'to bind'

e. Syllable type 5: CVC

"pip"	/pìp/	'king'
"'mur"	/múr/	'man'
"wa:l"	/wɑ̀l/	'ghost'
"'polpol"	/pólpol/	'calf of leg'

f. Syllable type 6: CVVC

""threeb"	/'ṭʰéeb/	'big'
""yool-tsa"	/'yóol-ca/	'to take away'
"=dzaa-b"	/'jàa-b/	'he arrives'
"=riim-sho"	/rìim-šo/	'nice'

g. Syllable type 7: CCVC

"'bre-b"	/bré-b/	'fall down' (third 'person plural)
"gyar-tsa"	/gyàr-ca/	'to play'
"'swang pa:-tsa"	/swáŋ pɑ-ca/	'to pretend'
"'dzya:n-me-tsa"	/jyɑn-mé-ca/	'to be born'

h. Syllable type 8: CCVVC

"=preek"	/'prèek/	'a tear'
"=kwo;ets"	/'kwȍec/	'Sunwar'
""gyaap-tsa"	/'gyáap-ca/	'to buy'
"groik-tsa"	/groik-ca/	'to burn' (house)

i. Syllable type 9: CVCC

"'tsirs"	/círs/	'small grain'
"tserb"	/cèrb/	'wheat'
"'ha:mts pa:-tsa"	/hɑ́mc pɑ-ca/	'to yawn'
"nips"	/nips/	'brain'

j. Syllable type 10: CCVCC

"kwungg"	/kwùŋg/	'hook'
"kyarsh"	/kyàrš/	'goat'
"'brol-b"	/bról-b/	'it breaks'
"al-brepts/	/?àl-brepc/	'small children'

2. Variation.

In this section consonant clusters and vowel clusters are treated as they occur in the ten syllable types.

For the distribution of phonemes in the

syllable, see Section II, 'Segmentals'.

a. Consonant clusters.

1) Syllable initial.

a) Chart.

		Second			
		r	l	w	y
First	p^h	x	x		
	p	x	x		
	b	x	(x)	x	
	k^h	x			
	k	x		x	x
	g	x	x		x
	j				x
	s			x	x
	š				x
	ŋ			x	

Of the 19 possible variations in initial position

11 occur in syllable type 3: CCV
7 occur in syllable type 4: CCVV
12 occur in syllable type 7: CCVC
7 occur in syllable type 8: CCVVC
4 occur in syllable type 10: CCVCC

b) Examples:

Type 3 :

"'phla;"	/p^hlá/	'wing'

"'ta:pla"	/tɑ́pla/	'palm of hand'
"bre-tsa"	/brè-ca/	'fall down'
("'shoble"	/šóble/	'bread')
"'khri-khri pa:-tsa"	/k^{h}rí-k^{h}ri pɑ-ca/	'to tremble'
"'kwo-tsa"	/kwó-ca/	'to look'
"'kye-tsa"	/kyé-ca/	'to boil'
"gra"	/grà/	'bamboo' (sliced)
"gru-tsa"	/grù-ca/	'to appear'
"glu-tsa"	/glù-ca/	'to rise' (sun, moon)
"gye-tsa"	/gyè-ca/	'to get thin'
"gyo-sho"	/gyò-šo/	'long'
"gyura"	/gyùra/	'right side'
"shye-tsa"	/šyè-ca/	'to catch'
"shyele"	/šyèle/	'thread'
"bwa:"	/bwɑ̀/	'rooster'

Type 4:

""phree-tsa"	/'p^{h}rée-ca/	'splinter'
""phle;e-tsa"	/'p^{h}lée-ca/	'to bind'
"=pree-tsa"	/'prèe-ca/	'to jump'
""proo-tsa"	/próo-ca/	'to weave'
"=prii-tsa"	/'prìi-ca/	'to fill'
"=brii-tsa"	/'brìi-ca/	'to fill itself'
"khrui"	/k^{h}rui/	'tooth'
"=khraa-tsa"	/'k^{h}ràa-ca/	'to step over'
"=kraa-tsa"	/'krâa-ca/	'to be caught'

""shyee-tsa"	/'šyée-ca/	'to teach'

Type 7:

"'plupse"	/plúpse/	'comb'
"'bre-b"	/bré-b/	'he falls down'
"=khrum-tsa"	/'k^{h}rùm-ca/	'to plant'
"krongledz"	/kròŋlej/	'mais'
"'kyor-tsa"	/kyór-ca/	'to cut'
"=grum-tsa"	/'grùm-ca/	'to meet'
"gyar-tsa"	/gyàr-ca/	'to play'
"'dzya:n-me-tsa"	/jyɑn-mé-ca/	'to be born'
"'dzyet-tsa"	/jyét-ca/	'to light'
"'swang pa:-tsa"	/swáŋ pɑ-ca/	'to pretend'
"'ngwon"	/ŋwón/	'far'
"syob-tsa"	/syòb-ca/	'to clean beer'
"'shyer"	/šyér/	'uncooked rice'

Type 8:

"=preek"	/'prèek/	'a tear'
"=bwaȧ:k"	/'bwàa:k/	'water'
"kwo;ets"	/'kwȍec/	'Sunwar'
"kyaik-tsa"	/kyàik-ca/	'to hang'
"groik-tsa"	/groik-ca/	'to burn' (house)
""gyaap-tsa"	/gyáap-ca/	'to buy'
""ngwo;ik-tsa"	/'ŋwőik-ta/	'to climb'

Type 10:

"'brol-b"	/bról-b/	'it breaks'
"=khrum-b"	/'k^{h}rùm-b/	'he plants'
"kwungg"	/kwùŋg/	'hook'
"kyarsh"	/kyàrš/	'goat'

2) Syllable final.

a) Chart.

Second

		b	t	g	c	s	š	n	y
First	p		x		x	x			
	g								x
	m	x			x				
	ŋ			x		x			
	r	x			x	x	x	x	
	l	x							

Of the 14 possible variations in final position
8 occur in syllable type 9: CVCC
6 occur in syllable type 10: CCVCC

b) Examples:

Type 9:

"'nupt"	/núpt/	'end'
"'gups"	/gúps/	'lion'
"gigy"	/gìgy/	'green'

"'ha :mts pa:-tsa"	/hɑ́mc pɑ-ca/	'to yawn'
"'a:ngs"	/?ɑ́ŋs/	'dividing'
"tserb"	/cèrb/	'small grain'
"wa:rts"	/wɑ̀rc/	'friend'
"'tsirs"	/círs/	'wheat'

Type 10:

"al-brepts"	/?àl-brepc/	'small children'
"=khrum-b"	/'k^hrùm-b/	'he plants'
"kwungg"	/kwùŋg/	'hook'
"kyarsh"	/kyàrš/	'goat'
"'kyor-na kyor-n"	/kyór-na kyor-n/	'he is cutting'
"'brol-b"	/ból-b/	'breakable'

b. Vowel clusters.

1) Oral vowel clusters.

a) Chart

Second

First

	i	e	a	u	o	ɑ
i	x		x			
e		x			x	
a	x		x			
u	x			x		
o	x	x			x	
ɑ				x		x

Each of the six vowels clusters with itself (geminates). Further

/i/ clusters with /a/ and vice versa,

/e/ clusters with /o/ and vice versa,

/u/ clusters with /i/,

/o/ clusters with /i/,

/α/ clusters with /u/.

Of the 13 possible variations in the complex syllable nucleus
11 occur in syllable type 2: CVV
7 occur in syllable type 4: CCVV
9 occur in syllable type 6: CVVC
8 occur in syllable type 8: CCVVC

b) Examples:

Type 2:

""tsii-tsa"	/'cíi-ca/	'to wash'
""bee-tsa"	/'bée-ca/	'to die'
"=dzaa-tsa"	/'jàa-ca/	'to arrive'
"ruu-tsa"	/rùu-ca/	'to have enough'
"tsoo-tsa"	/còo-ca/	'to deliver'
"pia"	/pia/	'head'
"reo"	/reo/	'rainfall'
"goe"	/goe/	'you' (polite)
"sai"	/sai/	'long ago'
"gui"	/gui/	'arm'
"ta:u"	/tαu/	'son'

Type 4:

"=prii-tsa"	/'prìi-ca/	'to fill'

"=pree-tsa"	/'prèe-ca/	'to jump'
"=khraa-tsa"	/'k^{h}ràa-ca/	'to step over'
"shyuu"	/šyùu/	'father-in-law'
""proo-tsa"	/'próo-ca/	'to weave'
"broe-tsa"	/broe-ca/	'to free oneself'
"=khrui"	/'k^{h}rùi/	'tooth'

Type 6:

""tsiib"	/'cíib/	'bird'
""threeb"	/'$ṭ^{h}$éeb/	'big'
"=dzaa-b"	/'jàa-b/	'he arrives'
"ruu-b"	/rùu-b/	'he has enough'
"tsoo-b"	/còo-b/	'he delivers'
"=bwaa:k"	/'bwàɑk/	'water'
"=laik-tsa"	/'làik-ca/	'to carry'
""hoik-tsa"	/'hóik-ca/	'to heat'
"'tuik-tsa"	/túik-ca/	'to know'

Type 8:

"=brii-b"	/'brìi-b/	'it fills'
"=bree-b"	/'brèe-b/	'he writes'
""gyaap-tsa"	/'gyáap-ca/	'to buy'
"gruu-b"	/grùu-b/	'he comes out'
"proo-b"	/pròo-b/	'he runs away'
"=kyaik-tsa"	/'kyàik-ca/	'to hang'
"kroik-tsa"	/kroik-ca/	'to cut'
"pruik-tsa"	/pruik-ca/	'to release'

2) Nasalized vowels.

Nasalized vowels occur in vowel clusters, of which one member of the cluster only is nasalized. The nasalized vowel fills the first slot of the VV-cluster. As an exception to this /ĩ/ also fills the second slot when following /o/ or /u/.

Nasalized vowel in first position:

a) Chart.

Second

		i	e	a	α	o	u
First	ĩ	x					
	ẽ		x				
	ã			x			
	α̃	x	x				
	õ	x	x				
	ũ						

Of the 7 possible variations
4 occur in syllable type 2: CVV
1 occurs in syllable type 4: CCVV
2 occur in syllable type 6: CVVC
2 occur in syllable type 8: CCVVC

b) Examples:

Type 2:

""hi;i-tsa"	/'hī́i-ca/	'to fear'
""de;e-tsa"	/'dḗe-ca/	'to say'
""pa:;i-tsa"	/'pā́i-ca/	'to wear ornaments'
"pha:;e-tsa"	/pʰãe-ca/	'to go to the same place regularly'

Type 4:

""phle;e-tsa"	/'pʰlḗe-ca/	'to bind'

Type 6:

"li;ik"	/lĩik/	'yeast'
""wo;ish"	/wṓiš/	'husband'

Type 8:

"shya;ab"	/šyǎab/	'beer'
"=kwo;ets"	/'kwṑec/	'Sunwar'

Nasalized vowels in second position:

a) Chart.

Second

		ĩ	ẽ	ã	ɑ̃	õ	ũ
First	i						
	e						
	a						
	α						
	o	x					
	u	x					

Of the 2 possible variations
2 occur in syllable type 2: CVV
1 occurs in syllable type 6: CVVC

b) Examples:

Type 2:

"=ngwoi;ti"	/'ŋwòĩti/	'in front of'
"pui;-tsa"	/puĩ-ca/	'to beg'

Type 6:

""ngwoi;k-tsa"	/'ŋwóĩk-ca/	'to climb'

3. Distribution.

a. The ten syllable types occur as monosyllabic foot, and in this function they carry tone. (For tone see Section II.).

b. Syllables with complex vowel nuclei are restricted to the nuclear position in the foot. The nuclear syllable carries the tone.

c. Syllables with final CC-cluster always occur in foot-final position.

II. Items of special interest - Tone.

The analysis of tone is incomplete. There is a clear contrast between contour tone and register tone. The contour tone occurs as high falling and low falling. The register tone contrasts as high and low. Tone seems to be relevant on a higher level than the syllable level and will be described in a later paper.

Tone does not influence or condition the contrasts of the phonemes described elsewhere in this report.

Examples

a. Stops and affricates.

1. High falling contour tone.

""phee-tsa"	/'p^hée-ca/	'to wear'
""pee-tsa"	/'pée-ca/	'to finish a work'
""bee-tsa"	/'bée-ca/	'to die'
""too-tsa"	/'tóo-ca/	'to drop an object'
""doo-tsa"	/'dóo-ca/	'to be dropped'
""sii-tsa"	/'síi-ca/	'to wash utensils'
""zii-tsa"	/'zíi-ca/	'to break bones'
""tsoo-tsa"	/'cóo-ca/	'to shut in'
""dzoo-tsa"	/'jóo-ca/	'to know events

2. Low falling contour tone.

"=pree-tsa"	/'prèe-ca/	'to jump'

"=bree-tsa"	/'brèe-ca/	'to write'
"=taa-tsa"	/'tàa-ca/	'to take'
"=daa-tsa"	/'dàa-ca/	'to swallow'
"=khraa-tsa"	/'k^{h}ràa-ca/	'to stop over'
"=graa-tsa"	/'gràa-ca/	'to win'
"=tsee-tsa"	/'cèe-ca/	'to cut'
"=dzee-tsa"	/'jèe-ca/	'to fall into rags'

b. Fricatives.

1. High falling contour tone.

""saam-tsa"	/'sáam-ca/	'to put beside'

2. Low falling contour tone.

"=saam-tsa"	/'sàam-ca/	'to loose'

c. Nasals.

1. High falling contour tone.

""maal-tsa"	/'máal-ca/	'to want'
""naa-tsa"	/'náa-ca/	'to chew'
""naik-tsa"	/'náik-ca/	'to rest'

2. Low falling contour tone.

"=maal-tsa"	/'màal-ca/	'to look for'
"=naa-tsa"	/'nàa-ca/	'to weigh'
"=naik-tsa"	/'nàik-ca/	'to pinch'

d. Vibrant.

1. High falling contour tone.

""riim-tsa"	/'ríim-ca/	'to wait'

2. Low falling contour tone.

"=riim-tsa"	/'rìim-ca/	'to be nice'

e. Some examples with register tone.

1. High.

"'tso-tsa"	/có-ca/	'to burn'
"'dzo-tsa"	/jó-ca/	'to graze'

2. Low.

"tuu-tsa"	/tùu-ca/	'to drink'
"duu-tsa"	/dùu-ca/	'to move'
"wa:;"	/wɑ̏/	'bear'
"bwa:"	/bwɑ̀/	'rooster'

SHERPA TONE AND HIGHER LEVELS

Kent Gordon

[The Sherpa tone system may be characterized in terms of two kinds of contrasts, contrasts of stress-placement (here termed 'intonation') and contrasts of pitch. The domain of both of these contrasts is the foot. A foot may consist of one, two, or three syllables. A coherent account of Sherpa tone must thus include an account of the syllable, the foot, intonation, and pitch. The relevant sections have been reproduced from Gordon (1969) for inclusion in this report. Gordon's analysis of vowels (six vowels plus two co-vowels, with the central or low vowels viewed as 'assimilating vowels') has been retained in this excerpt. For a statement comparing Gordon's analysis with the analysis used for the segmental synopsis given earlier in this volume, see Schoettelndreyer and Hale, 'Three Analyses of Sherpa Vowels'.]

I. Higher Levels.

A. Syllable.

The syllable in Sherpa has the potential expansion shape $C_1hv_1v_2VrC_2$ in which C_1h- constitutes syllable onset, -v_1v_2V- the nucleus, and -rC_2 the terminus.

1. Contrasting syllable types.

1) V

/'ú/	'breath'
/'ɑ́-ŋa/	'child'
/'í-wi/	'mother-in-law'
/"ɑ́-la/	'much, many'

2) C_1V

/'ká/	'stick'
/"kí/	'dog'
/"kí-la/	'to the dog'
/'rì-mu/	'mongoose'

3) C_1hV

/"khà/	'snow'
/"khí/	'you'

	/"khí-la/	'to you'
	/"phȉ-la/	'thigh'
4) C_1hv_1V	/'lhyá/	'navel'
	/'lhyá-la/	'at the navel'
	/'rhyá-suŋ/	'(he) burned it'
	/'khwá-ni/	'having brought'
5) C_1v_1V	/"myɑ̀/	'no'
	/"wyà/	'is'
	/'swɑ̀/	'eat!'
	/'kyà-ni/	'having done'
6) VC_2	/"óŋ-bu/	'camel'
	/"ùŋ-gu/	'to come'
	/"ȉn-di/	'to be'
	/'íp-rɑŋ/	'bee-hive'
7) C_1VC_2	/"ŋér-mu/	'half-witted'
	/'ṭíŋ-me/	'small'
	/"ṭȉk-pe/	'small'
	/'šȉŋ/	'field'
8) C_1hVC_2	/"ṭhíŋ-me/	'short'
	/"phȉŋ/	'noodles'
	/"thôk/	'roof'
	/"lháp/	'looking'
9) $C_1hv_1VC_2$	/"thwáp-la/	'for plucking (fruit)'

	/"rhyáp-la/	'for mixing'
10) $C_1v_1VC_2$	/"kyáp-la/	'for giving birth'
	/"šyáp-la/	'for dying'
	/"ḍwàp-la/	'on foot'
	/"cwáp-la/	'for grazing'
11) $C_1v_1v_2VC_2$	/"ŋywáp-la/	'for buying'
12) C_1VrC_2	/'ḍèrm-bu/	'guest'
	/"ŋérm-bu/	'half-witted'
13) C_1hVrC_2	/"thèrm-bu/	'high'

2. Variation.

1) C_1h-, before -h- /p, t, c, č, ṭ, k, r, l/ may occur

/"phí/	'wine'
/"thík/	'measuring line'
/"chì/	'elbow'
/"čhú/	'water'
/"ṭhì/	'knife'
/"khí/	'you' (Pl.)
/"rhá/	'hair'
/"lhó/	'look!'

2a) -v_1V-, after -y- /a, ɑ, o, u/

/'pyà/	'rat'
/"myɑ̀/	'no'
/"khyó/	'you' (sing.)
/'pyú/	'calf'

2b) $-v_1V-$, after -w- /a, α/

/'lhwá/	'hunger'
/'swà/	'eat!'

3) $-v_1v_2V-$, after -yw- /a/

/"ŋywàp/	'buying'

4) $-rC_2$, after -r- /m/

/"thèrmbu/	'tall

3. Distribution in phonological foot.

1) The following restrictions apply. The foot has the potential expansion shape $C_1hv_1v_2VrC_2(-C_1VC_2)$ in which - indicates syllable division.

a. C_1- is not filled by voiced stops in tone-1 feet.

b. $-C_1$ may be filled by voiced stops provided that C_2- is filled by nasal vowels or nasal consonants.

[At the time that this paper was written, Mr. Gordon felt that there were constraints on consonant clusters across syllable boundaries of such a nature that, given a cluster, one could often determine whether it contained a boundary between two feet or not. Further consideration of the data has brought him to the conclusion that this is not in general possible, and that the only reliable guide to foot boundaries are the pitch and intonation contours in terms of which they are directly defined. He had originally given five restrictions in this section, three of which have been omitted at his request. He now feels that the following chart is quite incomplete.]

2) Chart of the clusters.

	p	t	c	č	ṭ	k	b	d	j	ǰ	ḍ	g	s	š	m	n	ŋ	r	l	w	y	h
p		pt		pč									ps			pn		pr	pl			
t																			tl			
c																						
č																						
ṭ																						
k	kp	kt	kc	kč	kṭ									kš		kn						
m							mb			mǰ			ms			mn	mŋ					
n							nb	nd	nj				ns		nm	nn						
ŋ							ŋb	ŋd				ŋg	ŋs		ŋm	ŋn						
r	rp	rt	rc	rč		rk							rs		rm	rn				rw		
l								ld	lj	lǰ			ls		lm	ln				lw		

3) Illustrations (keyed to chart).

-pt-	/'sóptul/	'toothpaste'
-pč-	/'thépčuŋ/	'index finger'
-ps-	/"tàpsuŋ/	'(he) winnowed'
-pn-	/"tàpni/	'having winnowed'
-pr-	/'ìprɑŋ/	'fly'
-pl-	/'kɑ́pli/	'skull'
-tl-	/'kítli/	'teapot'
-kp-	/"lɑ̀kpa/	'hand, arm'
-kt-	/"òktum/	'fist'
-kc-	/'nɑ́kci/	'ink'
-kṭ-	/'míkṭuŋ/	'hole'
-kš-	/"bùkšel/	'cymbals'

-kn-	/"ḍìkni/	'having reconciled'
-mb-	/'bòmbu/	'large'
-mj-	/'nɑ̀mɟok/	'ear'
-ms-	/"jìmsuŋ/	'(he) caught (it)'
-mn-	/"jìmni/	'having caught (it)'
-mŋ-	/'tɑ́mŋe/	'speech'
-nb-	/'nénbu/	'sharp
-nd-	/'céndi/	'heavy'
-nj-	/"pɑ́nja/	'claw'
-ns-	/"bìsuŋ/	'(he) gave'
-nm-	/"ŋìnmu/	'daylight'
-nn-	/"bìnni/	'having given'
-ŋb-	/'ṭèŋbu/	'true'
-ŋd-	/"sɑ̀ŋduŋ/	'lama's long horn'
-ŋg-	/'ṭèŋge'/	'cold' (adj.)
-ŋs-	/'tɑ́ŋsuŋ/	'(he) released (it)'
-ŋm-	/"mòŋmu/	'moss'
-ŋn-	/'dùŋni/	'having beaten'
-rp-	/'kɑ́rpu/	'white'
-rt-	/'sórtuk/	'ring'
-rc-	/"khɑ̀rce/	'previously'
-rč-	/'pɑrči/	'often'
-rk-	/"ɑ́rkyok/	'horn, antler'
-rs-	/"tírsuŋ/	'(he) flipped (it)'
-rm-	/'sérmu/	'fingernail'
-rw-	/'mɑ̀rwu/	'red'

-ld-	/'rɑ̀ldiŋ/	'woven man'
-lj-	/'dɑ̀lja/	'friend'
-lj-	/'bɑ̀lǰɑn/	'spider'
-ls-	/"ṭhìlsuŋ/	'(he) wrapped (it)'
-lm-	/'sílmu/	'fresh'
-ln-	/"ṭhìlni/	'having wrapped'
-lw-	/'bɑ̀lwa/	'frog'

II. Tone (Stress and Pitch)

A. Phonological foot.

The phonological foot is the domain of contrastive tone and contrastive intonation. The phonological foot may consist of one to three syllables.

1. Contrast.

1) Tone-1, intonation-1 type.

"'kiq"	/"kí/	'dog'
"'tsaq"	/"cɑ́/	'grass'
"'saq"	/"sɑ́/	'tooth'
"'ngermuq"	/"ŋérmu/	'half-witted' (fem.)
"'sermuq"	/"sérmu/	'brass'
"'Thingmeq"	/"ṭhíŋme/	'short'
"'pekiwiq"	/"pékiwi/	'(he) will throw (it) cut'
"'zekiwiq"	/"šékiwi/	'(he) will speak'
"'longguwiq"	/"lóŋguwi/	'(he) will lift (it)'

2) Tone-1, intonation-2 type.

"tsiq"	/'cí/	'an accounting'
"taq"	/'tɑ́/	'horse'
"saq"	/'sɑ́/	'floor, ground'

"ŋgermuq"	/'ŋérmu/	'sister-in-law'
"sermuq"	/'sérmu/	'fingernail'
"Tiŋmeq"	/'ṭíŋme/	'small'
"pekiwiq"	/'pékiwi/	'(he) will open (it)'
"sekiwiq"	/'sékiwi/	'(he) will kill'
"Tikiwiq"	/'ṭíkiwi/	'(he) will ask'

3) Tone-2, intonation-1 type.

"'ti"	/"tì/	'that one'
"'nu"	/"nù/	'younger brother'
"'ca"	/"čɑ̀/	'hen'
"'ngerme"	/"ŋèrme/	'weak'
"'pumu"	/"pùmu/	'daughter'
"'mendok"	/"mèndok/	'egg, flower'

4) Tone-2, intonation-2 type.

"di"	/'dì/	'this one'
"nya"	/'nyɑ̀/	'fish'
"dza"	/'jɑ̀/	'rainbow'
"marwu"	/'mɑ̀rwu/	'red'
"lumu"	/'lùmu/	'kind of fruit'
"Tengge"	/'ṭèŋge/	'cold' (adj.)

2. *Variation*.

a) *Monosyllabic feet*. Following is a chart describing the variants of monosyllabic feet as they are manifested within phonological words preceding feet types 1, 2, 3, and 4 respectively.

	Type-1	Type-2	Type-3	Type-4
Type-1	Phonetic tone-1 unstressed	Phonetic tone-1 stressed tense	Phonetic tone-1 stressed tense	Phonetic tone-1 stressed tense
Type-2	Phonetic tone-2 unstressed length	Phonetic tone-2 stressed length	Phonetic tone-2 stressed tense	Phonetic tone-2 stressed tense
Type-3	Phonetic tone-3 unstressed	Phonetic tone-3 stressed length	Phonetic tone-3 unstressed	Phonetic tone-3 stressed
Type-4	Phonetic tone-4 unstressed lax	Phonetic tone-4 unstressed lax	Phonetic tone-4 unstressed lax	Phonetic tone-4 stressed lax

The stress feature as noted in the above chart and in the square-bracketed illustrations which follow pertains not to the foot but to the phonological word. This also applies to the occurrence of disyllabic feet in the same environments. Thus, the disyllabic illustrations in the first chart of b) 'Disyllabic feet' would fit the specifications of the above chart with respect to stress. See the comments on stress in II. B. 'Phonological Word'.

Illustrations. Following are examples keyed to the preceding chart. The chart with the examples gives only token treatment of the variants. The contrastive units being described in this section are not of the segmentable type, but are rather manifested in terms of waves which, as they span not only segments, but syllables as well, set up effects on other waves and are themselves affected by their own effects, as it were, and by the effects of other waves. In such a scheme, variation is exceedingly complex.

Contrast between the four types of feet are by no means consistently maintained. frequently intonation contrasts are neutralized. To date the conditions under which such neutralization takes place have not been fully investigated.

It should be noted, however, that monosyllabic feet are far more susceptable to neutralization than are disyllabic feet, the reason being that the wave-like contrasts are far better preserved when allowed to take shape on a stretch of speech consisting of two chest-pulse movements than they are when restricted to one pulsing movement.

When the contrasts are maintained with monosyllabic variants, pitch (to a greater extent than stress, etc.) fulfills that function. When the contrasts are maintained in respect of disyllabic variants, as they most often are, stress placement (in collaboration with pitch) is the significant factor.

The following symbols are used:

// = pause

' = stress

V^ = tense

$\underset{+}{V}$ = lax

$\overset{\text{—}}{}$
CV = pitch contour - phonetic tone-1

$\overline{CV}$ = pitch contour - phonetic tone-2

$\underline{CV}$ = pitch contour - phonetic tone-3

$\underset{\text{—}}{CV}$ = pitch contour - phonetic tone-4

1) Type-1 + type-1

/"kí "ŋí/ [//k̭i 'n̂i^//] 'two dogs'

2) Type-1 + type-2

/"kí 'čík/ [//'k̭i^tšιk̭'//] 'one dog'

3) Type-1 + type-3

/"kí "gyὰ/ [//'k̭i^g̭ʸɛʔ//] 'eight dogs'

4) Type-1 + type-4

/"kí 'ṭèŋ/ [//'k̭i^ṭɛŋ//] 'dogs'

5) Type-2 + type-2

/'cí "ŋí/ [//tsi· 'ɦi^//] 'two accounts'

6) Type-2 + type-2

/'cí 'čík/ [//tsi· 'tšɪk̖˺//] 'one account'

7) Type-2 + type-3

/'cí 'gyà/ [//'tsi g̭ʸɛʔ//] 'eight accounts'

8) Type-2 + type-3

~~/'cí '~~ṭèŋ/ [//'tsi ṭɛŋ//] 'accounts'

9) Type-3 + type-1

/"čà "ŋí/ [//tšɑ ɦi^//] 'two hens'

10) Type-3 + type-2

/"čà 'čík/ [//tšɑ· tšɪk̖˺] 'one hen'

11) Type-3 + type-3

/"čà "gyà/ [//tšɑ' g̭ʸɛʔ//] 'eight hens'

12) Type-3 + type-4

/"čà 'ṭèŋ/ [//'tšɑṭeŋ//] 'hens'

13) Type-4 + type-1

/'lò "ŋí/ [//l̆ʷo' ɦi^//] 'two years'

14) Type-4 + type-2

/'lò 'čík/ [//l̆ʷo' tšɪk̖˺//] 'one year'

15) Type-4 + type-3

/'lò "gyὰ/ [//$\overset{W}{\text{l}}$o'$\underset{\hat{}}{\text{g}}{}^{y}$e?//] 'eight years'

16) Type-4 + type-4

/'lè 'ṭèn/ [//'$\overset{W}{\text{l}}$eṭɛn//] 'annually'

Features of vowel tenseness versus laxness interact with vowel length and laryngealization (? and h), and consonant articulation. Following is a chart describing the occurrence and interaction of these various features in monosyllables bounded by pause. Relative degrees of applicability are indicated by plus and minus signs.

	Fortis Consonant	Tense Vowel	Lax Vowel	Extra Vowel Length	Laryngealization
Type-1	+ +	+ +	- -	-	+ +
Type-2	+	+	-	+	+ +
Type-3	-	-	+	+	+/-
Type-4	- -	- -	+ +	-	-

Of all the vowels /α/ is more likely to be preceded by a fortis consonant and least likely to undergo lengthening. /a/, on the other hand, is more susceptible to lengthening than it is to being preceded by a fortis consonant. Neither /a/ nor /α/ carry the tense/lax differential (perceptually) that /i, e, o/ and /u/ do. Moreover, the pitch differential between type-2 and type-3 monosyllables in /a/ is negligible. The contrast is instead carried by length with type-3 manifesting the longer vocoid.

Illustrations:

1. Examples in /α/.
   Beneath initial consonants „ indicates very fortis and , fortis. Note that the first two examples are distinguishable only in terms of the degree

to which fortis articulation characterizes the initial consonant. The plus sign ₊ indicates laxness of vowel.

type-1	/"sά/	[//s̤ʌʌ̱//]	'tooth'
type-2	/'sά/	[//s̩ʌʌ̱//]	'floor, ground'
type-3	/"čὰ/	[//t̲š̲α̲//]	'hen'
type-4	/'jα̃/	[//dzα̟//]	'rainbow'

2. Examples in /a/.

type-1	(no clear example of monosyllable).		
type-2	/'ná/	[n̥a·]	'day after tomorrow'
type-3	/"nà/	[n̥a·]	'type of wheat'
type-4	/'sà/	[sa̟·]	'copper'

Laryngealization (catch and spirant types) occurs post-vocalically with monosyllables in /i,e/ and /α/--and, in one instance, /a/. Here we are discussing laryngealization on a non-echoing type, that is, not brought about as a result of the occurrence of initial aspirated stops. Vowels /o/ and /u/ are not accompanied finally by laryngealization (except as preceded by aspirated stops). However, they are characteristically preceded by a very fortis variety of glottal catch. /α/ is ordinarily followed by [ʌ̱] (see examples above)/

It would appear that these features would be handled best at some higher level. They are described here, however, because their occurrence in almost every case is directly controlled by the type of foot involved--as the following chart will show. Thus, in column one, for example, the entries for type-1 and type-2 monosyllables exhibit neutralization of contrast due to the overlay of a high level (imperative sentence) intonation. Nevertheless, it is the foot-system which requires that the glottal closure not occur in type-4 monosyllables.

In some instance monosyllabic illustrations are not available, hence the use of polysyllables.

Type-1	Post-Vocalically	Pre-Vocalically	Pre-Consonantally (before back vowels)
Type-1	[peˆˀ]	[ˀλla]	[?ŋo]
	/"pé/	/"ála/	/"ŋó/
	'throw (it) out!'	'much, many'	'count (them)'
Type-2	[peˆˀ]	[?̤u]	[?̤ʷlᵒɔᵊ·]
	/'pé/	/'ú/	/lwa/
	'open (it)'	'breath'	'liver'
Type-3	[deˀ]	[ˀuŋgula]	[nʷɔᵊ]
	/"dè/	/"ùŋgula/	/ŋwα/
	'sit!'	'to come'	'cut (the grain)!'
Type-4	[ke]	[no example)	[lʷɒ]
	/'kè/		/lwα/
	'leave (us)!'		'get up!'

b) Disyllabic feet. With monosyllables a number of interacting features operate to preserve the appropriate differential between contrastive foot-types. With disyllabics the differential is carried primarily by pitch and intonation features. Note the following matrix display of types 1-4 as they occur before types 1-4 within the phonological word.

	Type-1	Type-2	Type-3	Type-4
Type-1	['nermu] /"ɳérmu/ 'half-witted'	['nermu]	['nermu]	['nermu]
Type-2	[nermu] /'ɳérmu/ 'sister-in-law'	['nermu]	['nermu]	['nermu]
Type-3	['pumu] /"pùmu/ 'daughter'	['pumu]	['pumu]	['pumu]
Type-4	['lumu] /'lùmu/ 'kind of fruit'	['lumu]	['lumu]	['lumu]

It appears that what we have labelled as contrastive intonation might be interpreted as contrastive pitch. This would give us a 4-tone system. Note, however the following matrix display illustrating the occurrence of foot types 1-4 at word-boundary before phonological word type-2 (CV'CV).

Type-1	[n̂er'mu sɩ'ŋ̥ɔ·kᵗ]	/"ɳérmu 'sì "nòk/ '(he) said half-witted'
Type-2	['n̂ermu sɩ'ŋ̥ɔ·kᵀ]	/'ɳérmu 'sì "nòk/ '(he) said sister-in-law'
Type-3	[pu'mu sɩ'ŋ̥ɔ·kᵀ]	/"pùmu 'sì "nòk/ '(he) said daughter'

Type-4 ['lumu sɩ'n̪ɔ̭·k˺] /'lùmu 'sî "nòk/

'(he) said kind of fruit'

Here the relevant contrasts are visible in terms of tone (types 1 and 2 versus types 3 and 4), and intonation (types 1 and 3 versus types 2 and 4). The first matrix above displays the intonation contrast in terms of pitch--not intonation. The second matrix displays the intonation contrasts in terms of stress placement, and the pitch line follows the intonation contour.

On the other hand, syllable tone might appear to account for the intonation contrasts. However, the following set of examples in which the second syllable of the foot is the same morpheme throughout, speaks against a syllable tone analysis. The environment is identical to that displayed in the matrix above.

Type-1	/"kíki/	[ki'ki]	'by the dog'
Type-2	/'téki/	['teki]	'by the horse'
Type-3	/"ṭè'ki/	[te'ki]	'by the mule'
Type-4	/'dìki/	['diki]	'by him' (prox.)

c) Trisyllabic feet. Trisyllabics manifest variants which are unlike those manifested by disyllabics in that the addition of a third syllable gives a different intonation shape to the foot. Note the shapes of foot types 1 and 2 with trisyllabics.

Type-1 ['tšek̭i'wi· sɩ'n̪ɔ̭·k˺] /"čékiwi 'sì "nòk/

'(he) said he would set fire to (it)'

Type-2 ['tše·k̭i,wi· sɩ'n̪ɔ̭·k˺] /'čekiwi 'sì "nòk/

'(he) said he would cut (it)'

An element of secondary stress is introduced and the primary stressed syllable is lengthened. In other essential respects the intonation shapes (and pitch contour shapes) are identical to those of disyllabics.

Contrast between types 3 and 4 is essentially neutralized in trisyllabic feet. With foot type-4 trisyllabics, the third rather than the first syllable carries the primary stress before phonological word type-2 (CV'CV). Note the following examples:

	Before phonological word-2 (CV'CV)	Before pause
Type-3	[ˌṭeki'wi· sı'ŋɔ·k˺]	['ṭekuˌla·//]
	/"ṭèkiwi 'sì "nòk/	/"ṭèkula/
	'(he) said (he) would scratch'	'for scratching'
Type-4	[ˌṭiki'wi· sı'ŋɔ·ḳ˺]	['ṭikuˌla·//]
	/'ṭìkiwi 'sì "nòk/	/'ṭìkula/
	'(he) said (he) would ask'	'for asking'

The words used in the matrix above contrast as follows:

/"ṭèsuŋ/	[ṭe'sun]	'(he) scratched'
/'ṭìsuŋ/	['ṭisuŋ]	'(he) wrote'

Perhaps the neutralization of contrast here can be explained as a result of an overriding word-level intonation feature. Referring back to the matrix at the beginning of section (b) 'Disyllabic feet', it will be seen that foot-intonation is essentially neutralized within the phonological word at the intersection of types 3 and 4 with types 2 and 4. The neutralization is there seen to be a result of a word-level feature. That this feature is operative on foot type-4 (making it assimilate to foot type-3) but not on types 1 and 2 is attributed to the character of type-4 feet. For though the foot system is essentially dichotomous (tone versus intonation) there is a sense in which the 4 types are mutually dissimilar (see charts under 2a 'monosyllabic feet' which give features distinguishing each type). There is a ranking of types in terms of four pitch levels and four degrees of tense/lax. It is therefore not systematically obligatory that type-2 as well as type-4 should undergo neutralization of contrast--that is, assimilate to type-1.

3. Distribution. Phonological feet are distributed in the matrix provided by the phonological word. Co-occurrence restrictions are as follows.

1) Types-1 and -2 do not precede type-4 in phonological word type-2 (CV'CV).

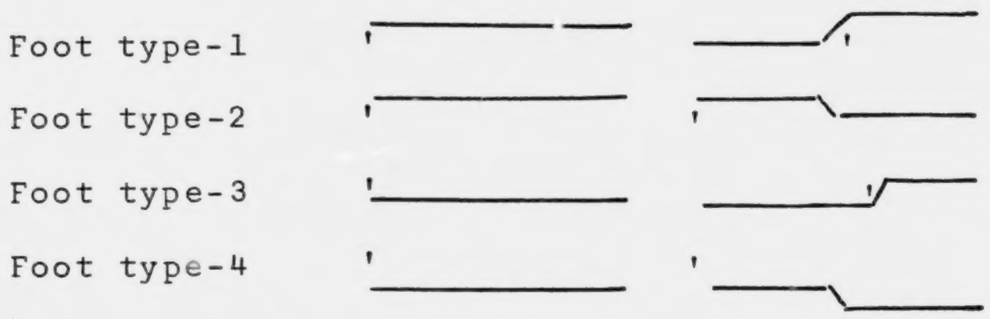
2) Type-4 does not precede types-1 and -2 in phonological word type-1 ('CVCV).

3) Type-1 does not precede type-3 in phonological word type-2.

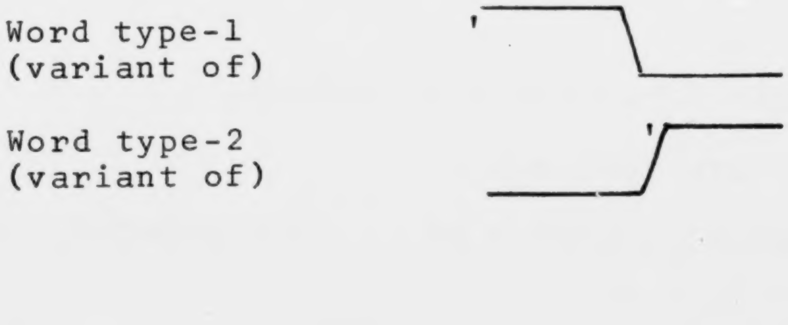
4) Type-3 does not precede type-1 in phonological word type-1.

B. Phonological word.

The phonological word contrasts with lower level structures such as the foot by features of stress and pitch. Thus, for example the foot may have the following pitch and stress contours.



The phonological word may have altogether different shapes than these, as for example:



Illustrations:

1) /"kų́ 'kìwi/	['ku kị̂,wi//]	'(he) will steal'
2) /'kùkiwi/	['ku kị̂,wi//]	'(hɛ) will paint'
3) /'lò "ŋì/	[ʷlo'ñi^//]	'two years'
4) 'lų̀mu/	['lumu//]	'kind of fruit'

Each of the above illustrations constitutes one phonological word; but examples 1 and 3 are made up of two phonological feet whereas 2 and 4 are composed of only one each. Example 1 has "kú-, a type-2 foot succeeded by 'kìwi, a type-4 foot which retains its identity as a separate foot when occurring with verbs like "kú-, that is, 'kú- type verbs ordinarily require the auxiliary 'kì- (thus, ['kũ,kị̂řula] /"kṹ 'kìrula/ 'in order to steal'), whereas verbs of the 'kú- type require -kiwi to mark present/future tense, but not as a verbal auxiliary (thus ['kuṭula] /'kútula/ 'in order to paint').

1. Contrast. There are two types of phonological words; these may be formulated generally as 'CVCV versus CV'CV. Contrasts for these have been given under II. A. Phonological foot. Following are a few more illustrations.

'CVCV	/"kí 'ṭèŋ/	['kị̂^ṭɛŋ]	'dogs'
	/'cí 'ṭèŋ/	['tsiṭɛŋ]	'accounts'
CV'CV	/"ṭè "ŋi/	[ṭe'ñi^]	'two mules'
	/'bù 'čík/	[bu'tsɪk̂']	'one insect'

Contrast between phonological word types is maintained with monosyllabics by features of length, pitch, tense/lax, fortis/lenis and laryngealization (see (2a) 'Monosyllabic feet' above).

2. Variation. (CV = syllable).

Type-1 has variants:

['CVCV], ['CVCV,CV], ['CV,CVCVCV], ['CVCV,CVCV], ['CVCVCV,CV], [CV'CVCV,CV], etc.

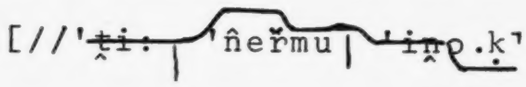
All of these occur before word type-1 or word type-2 or pause, with the exception of the last variant given which probably occurs only before pause.

Type-2 has variants:

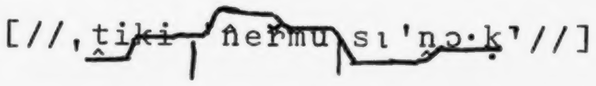
[CV'CV], [,CVCV'CV], [,CVCVCV'CV], [CV,CVCV'CV], etc.

These occur before word type-2.

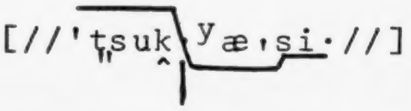
Illustrations of type-1. The word in focus occurs medially. Word boundaries are marked by | .

1) 
[//'ṱi: | 'n̂eřmu | 'iṋɔ.ḳ˺] /"tikì 'ηérmu ìn "nòk/

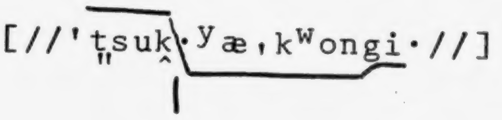
'that was the sister-in-law'

2) 
[//,tik̭i | 'n̂eřmu | sɩ'n̪ɔ̭·ḳ˺//] /"tikì 'ηérmu 'sì "nòk/

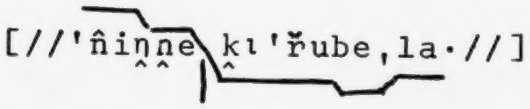
'(he) said sister-in-law'

3) 
[//'t̪̏suk̭ | ʸæ,si·//] /"cúk 'kyàsi/

'what sort of activities...'

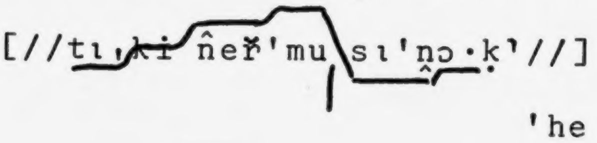
4) 
[//'t̪̏suk̭ | ·ʸæ,kʷongi·//] /"cúk 'kyà 'kòngi/

'what they are wearing'

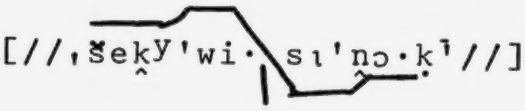
5) 
[//'n̂iṋṋe | k̭ɩ'řube,la·//] /'ηíηne 'kìru 'bèla/

'at the time of celebrating the festival of Ngingne...'

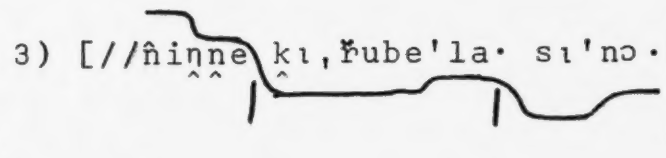
Illustrations of type-2.

1) 
[//tɩ,ki n̂eř'mu | sɩ'n̪ɔ̭·ḳ˺//] /"tìki"ηérmu 'sì "nòk/

'he said half-witted'

2) 
[//,šek̭ʸ'wi· | sɩ'n̪ɔ̭·ḳ˺//] /"šékiwi 'sì "nòk/

'(he) said he would speak'



3) [//n̂iŋ̭ṋe k̭ɪ,r̽ube'la· sɪ'nɔ·ḳ'//]

/'ŋíŋne 'kìru 'bèlə 'sì "nòk/

'(he) said at the time of celebrating Ngingne...'

3. Distribution in phrase (pause-group). Restrictions of occurrence not investigated to date.

C. Phonological phrase.

The phonological phrase contrasts with the phonological word in terms of pause characteristics: the phrase is bounded by pause; the word is not. Word boundaries are marked by such features as:

1) length (on monosyllables) preceding boundary (see example 1 under II.B. 'Phonological Word, variation').

2) lenis medial consonant in unstressed syllable (preceded by secondary stress) precedes boundary followed by occurrence of word type-1 (see example 2, under II.B. above).

3) only one primary stress per phonological word.

4) unstressed syllable with lowered and/or shortened variants which are followed by primary stressed syllables are preceded by word boundaries (see example 2 under II.B. above).

5) if a stressed syllable is preceded by a syllable manifesting unshortened close-vowel variants, the boundary occurs between them (see example 2 under II.B. above).

But phonological phrase boundaries are marked by length followed by pause. Note the following example:

[//'n̂iŋ̭ṋe·?? //'sɪr̽uˌti· //'dz̽ɪnbɑ'ṱoŋgu 'iŋ̽//]

/'ŋíŋne--- 'sìruti 'ɟ̽ìnba "tóŋgu "ìn/

'Ngingne--the name of a charity festival...'

Stress characteristics of the phonological phrase: Rhythm, stress, or isochronic stress grouping is a feature of phonological phrase. The above example illustrates the occurrence of this feature in the phrase:

[//'dzınbɑ'ṱoŋgu'iṋ//]

The nucleus of this phrase so far as stress is concerned is indeterminate, the stress timing serving to distribute the prominence equally over the words that make up the phrase.

This feature of isochronic stress grouping may provide the explanation for the neutralization of intonation contrasts discussed above under II.A.2c 'Variation, Trisyllabic feet'

D. Phonological sentence.

The phonological sentence is characterized by down-drifting pitch.

[//'n̂iŋ̭ŋ̭e·ˀˀˀ //'sıřu,ṱi· //'džınbɑ't͓oŋgu'iṋ//]

As the sentence terminus is approached or, as in the above illustration, drift approaches ebb-point, significant pitch contrasts are all but neutralized. Note /'ǰìnba/ versus /"tóŋgu/ in the above illustration. The low-high contrast is retained by the slight interruption of the drifting process at ['t͓oŋgu], which had it been a tone-2 foot, would have dropped below ['džınbɑ] in pitch.

The nucleus of the sentence is marked by stress, which ordinarily occurs in the sentence final phrase. The above illustration, taken from recorded text, consists of a string of phrases but lacks the nuclear stress characteristics of the phonological sentence. It turns out that, as recorded, this utterance is characterized by hesitation--which accounts for the lack of sentence stress. Moreover, in requesting a number of repetitions of this same utterance from the informant, the following was invariably given:

[//'n̂iŋ̭ŋ̭e· //'sıřu,ṱi· //'džınbɑ"t͓oŋgu'in͓//]

(" indicates sentence stress and sentence boundary).

Thus, the informant invariably provided sentence closure and stress in non-hesitation forms of the same utterance.

PHONOLOGICAL SEGMENTS

A NOTE ON THE SEGMENTAL SYNOPSES

The segmental synopses presented in this section are shorter versions of the segmental sections of longer phonemic summaries. (For bibliographical listings of these, see the article, Hale, 'A Phonological Survey of Seven Bodic Languages of Nepal' earlier in this volume.) Summarization of the segmental materials was done by Austin Hale. In the case of Sherpa some modifications of Kent Gordon's original analysis were made by Burkhard Schoettelndreyer and incorporated here. Kent Gordon has objected to some of these modifications and his comments have been quite helpful in stimulating further work on Sherpa Segmentals. For a brief account of this exchange see the section on vowels in 'A Phonological Survey...' elsewhere in this volume. Unfortunately, it has not been possible to incorporate all of these improvements in the synopsis presented below. For all the other languages, these synopses represent fairly straightforward presentations of the original analyses. The summarizer is grateful for the many corrections and helpful suggestions made by the various teams represented herein without which this section would have been much the weaker.

In most cases segmentals are discussed under three main heads: (1) Obstruants (including stops, affricates and fricatives), (2) Sonants (including liquids, nasals and glides) and (3) vowels. In the Sunwar Synopsis there is a section on glottals and in the Newari Synopsis, sonants and fricatives are grouped as continuant consonants. Evidence for contrast and variation is given within each of these sections. Since in some cases aspirated consonants have been interpreted as clusters and certain vowel clusters are realized in some cases as portmanteau (coalescing) phones, we have given the more important clusters occuring within the syllable early in each section so as to aid the reader in making comparisons across the languages. In addition to this, a section on distribution of consonants follows the section on sonants (or continuants) and a subsection on vowel distribution is found at the end of the section on vowels in each synopsis. For description of syllable and higher level structures the reader is referred to the following section.

Certain conventions have been followed throughout the synopses. Numbers preceding consonant clusters, and phones in the variation tables refer to examples which follow later in the synopsis. In general, where the amount of segmental variation within a system warrants it, the data has been summarized in a variation table. The horizontal axis of such a table is divided into columns which correspond to the various environments that condition variation from the norm. The vertical axis of such a table is divided into rows corresponding to the phonemes which are influenced by the listed environments. A cell, when filled, specifies the variant of a particular phoneme occurring in the listed environment. The number in the cell refers to an example of the variant given below the table. Where a cell is empty, the listed environment does not effect a variation from the norm of the particular phoneme involved of sufficient degree and consistency to be impressionistically significant. In a few cases hyphens have been placed in cells that are empty because distributional constraints prevent the occurrence of the relevant phoneme in the listed environment. In some cases a phoneme may occur simultaneously in two listed environments. In such cases we say that environments intersect. Intersecting environments have been handled in three ways in these charts. In some cases, the intersecting environments were given as adjacent columns in the table, and the variant resulting from the intersection of environments was run across both columns. In other cases, one set of environments was charted in the vertical axis, the other on the horizontal axis. This meant that certain environments were listed several times in the table, once under each phoneme influenced. In a very few cases a separate table was given for certain intersections.

Where parenthesized abbreviations follow English glosses in the examples, the reader is referred to the abbreviations listed with the text collections. These are for the most part grammatical glosses. Text orthography is enclosed in double quotation marks, the phonemic transcription is enclosed in slashes, the phonetics in square brackets, and the English glosses in single quotation marks. A slash between phones or between phonetic examples within square brackets is used to indicate fluctuation. In this usage there is no significant difference between the slash and the variation sign ∿ which is also used.

GURUNG SEGMENTAL SYNOPSIS

Warren W. Glover

A. Obstruants in Gurung

1. Contrast

Gurung may be described as having the following system of stops, fricatives and affricates (obstruants):

p	t	ṭ	c	k
p^h	t^h	ṭ^h	c^h	k^h
b	d	ḍ	j	g
	s			

The characters used in the diagram above are those of the phonemic transcription. The text orthography differs from the phonemic transcription in the following way: aspiration /^{h}/ is written on the line "h", retroflex stops are upper case /ṭ/ = "T", /ṭh/ = "Th", /ḍ/ = "D", and affricates are written as clusters: /c/ = 'ts', /c^h/ = "tsh", and /j/ = "dz".

Choosing this system of obstruants entails choosing the following system of syllable-initial clusters:

pr	pl	py	pw	-
p^hr	p^hl	p^hy	p^hw	-
br*	bl	by	-	-
mr	ml	my	mw	-
-	-	-	ṭw	-
-	-	ḍy	-	-
-	-	cy	cw	cyw
-	-	c^hy	c^hw	c^hyw
-	-	jy	-	-
-	-	sy	sw	syw

kr	kl	ky	kw	kyw
k^{h}r	-	k^{h}y	k^{h}w	-
gr	-	gy	-	-
ŋr**	-	ŋy	ŋw	ŋyw

*Not observed word-initially

**In a word attributed by the primary informant to another dialect.

Evidence for contrast in the system of obstruants is found in examples like the following. (For examples of clusters see section (C) 'Distribution of Consonants' below.

"piba"	/piba/	'to be shy'
"phiba"	/p^{h}iba/	'to be born'
"biba"	/biba/	'to say'
"tihq"	/tí^h/	'load, bundle'
"thi"	/t^{h}i/	'savings'
"dIhq"	/dĩ^h/	'house'
"tEba"	/tẽba/	'to show'
"thEba"	/t^{h}ẽba/	'to put'
"dEhbaq"	/dẽ^{h}bá/	'to pack' (mud on paddy wall)
"Tiba"	/ṭiba/	'to sit, dwell'
"Thiqba"	/ṭ^{h}íba/	'to strike a glancing blow'
"Dibdzi"	/ḍibji/	'handleless sauce pan'
"Tuhbi"	/ṭu^{h}bi/	'skin'
"ThuDuq"	/ṭ^{h}uḍú/	'grain stubble'
"DUhDiq"	/ḍũ^{h}ḍí/	'ear-ring worn in the center of the ear'

"tsuba"	/cuba/	'to break'
"tshuba"	/c^{h}uba/	'to be enjoyable'
"dzuwa"	/juwa/	'mother's brother's wife'
"suqba"	/súba/	'to turn inside out'
"tsO"	/cõ/	'eldest brother's wife'
"tshO"	/c^{h}õ/	'trade'
"dzOhbaq"	/jõ^{h}bá/	'to pour'
"sOq"	/sṍ/	'three'
"kuq"	/kú/	'nine'
"khuq"	/k^{h}ú/	'soup
"gudzi"	/guji/	'pocket'
"koq"	/kó/	'blood'
"khoq"	/k^{h}ó/	'come!'
"gOhq"	/gṍ^{h}/	'overgrown'

2. Variation

Parallel variation in Gurung obstruants appears to be effected by non-parallel environments. In describing variation we will thus group phonetically similar variants and speak of parallel processes as conditioned by divergent variants according to parallel environments. Five processes have been observed.

a. Aspiration. Voiced stops and affricates are phonetically aspirated word-initially before breathy vowels.

b. Coalescence (yielding portmanteau phones). Two processes are involved.

    1. Affricates are phonetically grooved in coalescence with a following /y/.

2. /k/ is a voiceless lateral fricative with palatal release in coalescence with a following /l/.

c. Fricativization: Four different environments are involved.

1. /ph/ is [ᵽ] word-initial in relaxed speech.

2. /b/ is [ƀ] word-medially in relaxed speech.

3. /k^h/ is (sometimes) [x] and /g/ is [ǥ] intervocalically following a breathy vowel.

4. /ḓ/ is [đ̭] word-finally in relaxed speech.

d. Flapped: /ḍ/ is [ṛ̌] intervocalically

e. Unreleased: /d/ is (sometimes) [d ˺] before a pause or a following stop.

In the following chart the variant groups given above are plotted against phonemes and the observed phonetic values are placed in the cells. Numbers in the cells refer to the examples that follow.

	"norm"	a	b	c	d	e
/p/	1.[p]					
/p^h/	2.[p^h]			3.[ᵽ]		
/b/	4.[b]	5.[b$^{\hat{h}}$]		6.[ƀ]		
/t/	7.[ṱ]					
/t^h/	8.[ṱ^h]					
/d/	9.[ḓ]	10.[ḓ$^{\hat{h}}$]		11.[đ̭]		12.[ḓ ˺]
/ṭ/	13.[ṭ]					
/ṭ^h/	14.[ṭh]					
/ḍ/	15.[ḍ]	16.[ḍ$^{\hat{h}}$]			17.[ṛ̌]	
/c/	18.[ts]		19.[tš]			
/c^h/	20.[ts^h]		21.[tš^h]			
/j/	22.[dz]	23.[dz$^{\hat{h}}$]	24.[dž]			
		25.[dž$^{\hat{h}}$]				

	"norm"	a	b	c	d	e
/s/	26.[s]		27.[š]			
/k/	28.[k]		29.[ǂʸ]			
/kʰ/	30.[kʰ]			31.[x]		
/g/	32.[g]	33.[gĥ]		34.[ɡ]		

The following are examples of the variants charted above:

1. [p] voiceless unaspirated bilabial stop
   - /pẽ/ [pʸǣ] 'tad pole'
   - /plo/ [plɔ̄] 'sole (of foot)'
2. [pʰ] voiceless aspirated bilabial stop
   - /pʰeba ro/ [pʰʸɛ̄bə̄r̽ɔ̈] 'to cost, he said'
3. [ᵽ] voiceless bilabial fricative
   - /phṹ/ [ᵽṹ] 'egg'
4. [b] voiced unaspirated bilabial stop
   - /pʰeba ro/ [pʰʸɛ̄bə r̽ɔ̄] 'to cost, he said'
5. [bĥ] voiced aspirated bilabial stop
   - /bɔ̃́ʰ/ [bĥɔ̃̆ĥ] 'strength'
6. [ƀ] voiced bilabial fricative
   - /saé pʰeba/ [sə́ɛ ᵽʸɛ̄ƀə̄] 'to cost a price'
7. [ṱ] voiceless unaspirated interdental stop
   - /ti/ [ṱī] 'corner'
8. [ṱʰ] voiceless aspirated interdental stop
   - /tʰi/ [ṱʰī] 'savings'
9. [d] voiced unaspirated interdental stop
   - /tidî/ [ṱīdī] 'one year'

10. [ḓʱ] voiced aspirated interdental stop

/díʰ/ [ḓʱī̆ʱ] 'house'

11. [đ̭] voiced interdental fricative

/ṭid/ [ṭī̀đ̭] 'please stay!'

12. [ḓ ˺] unreleased voiced unaspirated interdental stop

/ya:ʰd/ [yʱə̀ʱə̀ʱḓ˺] 'go!'

13. [ṭ] voiceless unaspirated retroflex stop

/ṭúʰ/ [ṭū̆ʱ] 'six'

14. [ṭʰ] voiceless aspirated retroflex stop

/ṭʰíba/ [ṭʰíƀə̄] 'to strike a match'

15. [ḍ] voiced unaspirated retroflex stop

/ḍa:lu/ [ḍə̀əlù] 'closely woven basket'

16. [ḍʱ] voiced aspirated retroflex stop

/ḍũʱḍí/ [ḍʱũ̀ʱṛ̆ī] 'ear-ring worn in the center of the ear'

17. [ṛ̆] voiced retroflex flap

/uíḍa:/ [ūíṛ̆ə̄:] 'liver'

18. [ts] voiceless unaspirated alveolar affricate

/ciʰ/ [tsī̀ʱ] 'small bush'

19. [tš] voiceless unaspirated alveo-palatal affricate

/cyõ/ [tšɔ̃̄] 'trap'

20. [tsʰ] voiceless aspirated alveolar affricate

/cʰõ/ [tsʰɔ̃̄] 'trade'

21. [tšʰ] voiceless aspirated alveo-palatal affricate

/cʰyố/ [tšʰɔ̃́ʔ] 'let's go!'

22. [dz] voiced unaspirated alveolar affricate

/jă:s/ [dzə̀ə̀s] 'test'

23.[dzʱ] voiced aspirated alveolar affricate

/jaʰlé/ [dzʱəʱlɛ̄] 'then;

24. [dž] voiced unaspirated alveo-palatal affricate

/jyu/ [džù] 'life, body'

25. [džʱ] voiced aspirated alveo-palatal affricate

/jya:ʰlí/ [džʱə̀ʱə̀ʱlī] 'net'

26. [s] voiceless alveolar fricative

/sṓ/ [sɔ̄́] 'three'

27. [š] voiceless alveo-palatal grooved fricative

/syõ/ [šɔ̄] 'bell, stream'

28. [k] voiceless unaspirated velar stop

/koʰ/ [kṑʱ] 'upper back'

29. [ɬ̟ʸ] voiceless lateral fricative with palatal release

/kloʰ/ [ɬ̟ʸṑʱ] 'place'

30. [kʰ] voiceless aspirated velar stop

/kʰā́:ba/ [kʰə́ə́ƀā] 'to be able'

31. [x] voiceless velar fricative

/aʰkʰā́:/ [ə̀ʱxə̄̀ʱə̄ʱ] '(I) am not able'

32. [g] voiced unaspirated velar stop

/ga/ [gə̀] 'copular verb'

33. [gʱ] voiced aspirated velar stop

/gyŏʰsyi/ [gʱỳʱɔ̄̀ʱšī] 'alder tree'

34. [ǥ] voiced velar fricative

/aʰgī́/ [ə̀ʱǥʸī̌] 'eldest brother'

B. Sonants in Gurung

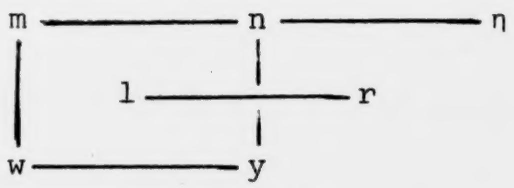
1. Contrast:

Gurung may be described as having the following sonants:

nasals:

liquids:

glides:



For a listing of the clusters in which the sonants are found see section (A.1) Obstruants, Contrast above.

The characters used in the diagram above are those of the phonemic transcription. Text orthography differs in that /ŋ/ = "ng".

Evidence for contrast among sonants may be found in examples like the following:

"ma"	/ma/	'below'
"na"	/na/	'nose'
"nga"	/ŋa/	'I'
"raah"	/ra:^{h}/	'pond'
"laah"	/la:^{h}/	'wax seal'
"yaahba"	/ya:^{h}ba/	'to go'
"waahq"	/wá:^{h}/	'question particle'
"tsyiba"	/cyiba/	'prestigious'
"tswiba"	/cwiba/	'to pierce, stab'

2. Variants

Sonants fall into three distinct classes in Gurung from the point of view of environments that condition variation: The set of environments that conditions non-norm variation in nasals is as follows:

a. Fronting: before /i, e/ and /y/

b. Syllabicity: before /r/

In addition to this, /n/ varies freely before back vowels between [n̪] and [n]. This variation will thus be illustrated under the "norm".

	"norm"	a	b
/m/	1.[m]		2.[ṃ]
/n/	3.[ṋ∿n]	4.[ṋ]	
/ŋ/	5.[ŋ]	6.[ŋ̭]	

The set of environments that conditions non-norm variation in liquids is as follows:

c. Nasalization: between /m/ and a nasalized vowel: /m__Ṽ/

d. Voiceless release: initial before a breathy vowel.

e. Devoicing: following a voiceless aspirated stop.

f. Coalescence: following /k/

g. Fortis: initial before a vowel with high tone.

	"norm"	c	d	e	f	g
/r/	7.[ř]	8.[ń]	9.[ř́ř̠]	10.[ř̠]		
/l/	11.[l]			12.[ɫ]	13.[ɫ̟ʸ]	14.[l̩]

The set of environments that conditions non-norm variation in glides is as follows:

h. Aspiration: preceding a breathy vowel.

	"norm"	h
/y/	15.[y]	16.[yʱ]
/w/	17.[w]	18.[wʱ]

Numbers in the cells above refer to the following examples:

1. [m] voiced bilabial nasal
/mi/ [m^{y}ī] 'fire tail'

2. [m̩] syllabic voiced bilabial nasal
/mrá~~:/~~ [m̩řə́:]

3. [ṋ∿n] voiced interdental / alveolar nasal
/no/ [ṋɔ̄ / nɔ̄] 'lean meat'

4. [ṋ] voiced interdental nasal
/né/ [ṋɛ́] 'full'

5. [ŋ] voiced velar nasal
/ŋa/ [ŋə̄] 'I'

6. [ɲ] voiced palatal nasal
/ŋe^{h}/ [ŋ̭^{y}ɛ̀^{ɦ}] 'milk'

7. [ř] voiced alveolar oral flap
/riba/ [řīƀə̄] 'to rise'

8. [ň] voiced alveolar flapped nasal
/mrṍ/ [mňɔ̃́] 'rice field'

9. [řř̠] voiced alveolar flap with voiceless release
/ri^{h}ba/ [řř̠ì^{ɦ}ƀə̀] 'to beg'

10. [ř] voiceless alveolar flap
/p^{h}rẽ/ [p^{h}ræ̃̄] 'young man'

11. [l] lenis voiced lateral
/lẽ^{h}ba/ [læ̃̀^{h}ƀə̂] 'to lap up'

12. [ɬ] voiceless lateral
/p^{h}leba/ [p^{h}ɬɛ̄ƀə̄] 'to get lost'

13. [ɬ̟^{y}] voiceless lateral fricative with palatal release
/kle^{h}/ [ɬ̟^{y}ɛ̀^{ɦ}] 'owner'

14. [l̪] fortis voiced lateral

/lí/ [l̪í] 'face'

15. [y] voiced high front oral unrounded clear vocoid, with tongue tip held well down behind the bottom teeth

/yo/ [yɔ̄] 'hand'

16. [yʱ] voiced high front oral unrounded breathy vocoid with tongue tip held well down behind the bottom teeth

/ya:ʰle/ [ỳʱə̀ʱə̀ʱlɛ̀] 'let us go'

17. [w] voiced high back oral rounded clear vocoid

/wa:ba/ [wə̄ə̄ƀə̄] 'to cut (hair)'

18. [wʱ] voiced high back oral rounded breathy vocoid

/mwíʰ/ [mẁʱɪ̄ʱ] 'rupees'

C. Distribution of Consonants

If one distinguishes consonants from medials (/y, w, r/ and /l/) all consonants and medials occur alone in syllable initial position. Word-finally only /b, d, m/ and /n/ occur in native stock. /s/ is added to the list of segments occurring in final position if loan words are considered.

All voiced consonants and all medials occur intervocalically. Voiceless stops occur in geminate clusters intervocalically in loan words. Voiceless aspirated stops occur intervocalically only following the negative prefix.

Voiceless aspirated stops do not occur before breathy vowels and voiced stops rarely occur before clear vowels except in loans. /s/ has been observed to occur before a breathy vowel in only one example.

All consonants occur before both high and low tone but very few indigenous words have voiced stops preceding low tone.

These observations regarding the distribution of consonants may be charted as follows:

a. Word-initial

b. Syllable-initial word medial

c. Following a consonant and preceding a vowel: C _V

d. Intervocalic

e. Syllable-final, word medial

f. Before clear vowels

g. Before breathy vowels

h. Before high vowels

i. Before low vowels

j. Word-final

	a	b	c	d	e	f	g	h	i	j
p,t,ṭ,c,k	1	10*	0	0	10*	1	26	33	1	0
p^h,t^h,$ṭ^h$,c^h,k^h	2	11	0	0	0	2	0	34	2	0
b, d	3	12	0	12	21	3	27	35	3	21
ḍ	4	13	0	13	0	4	28	36	4	0
j, g	5	14	0	14	0	5	29	37	5	0
s	6	15	0	15	22	6	30	38	6	22
m, n	7	16	0	16	23	7	31	39	7	23
ŋ	8	17	0	17	24	8	32	40	8	0
y, w, r, l	9	18	19	18	25**	18	9	41	9	0

*Only /p, t/ occur **Only /l, r/ occur here.
Numbers in the cells refer to the following sets of examples.

1.	/piba/	'to be shy'
	/ti/	'corner'
	/ṭiba/	'to sit, dwell'
	/cuba/	'to break'

	/kubaé/	'kapok'
2.	/p^{h}iba/	'to be born'
	/t^{h}i/	'savings'
	/ṭ^{h}a:gu/	'eldest son'
	/c^{h}õ/	'trade'
	/k^{h}aba/	'to come
3.	/biba/	'to say'
	/da:la/	'lentils'
4.	/ḍibji/	'handleless sauce pan'
5.	/juwa/	'mother's brother's wife'
	/guji/	'pocket'
6.	/sã:/	'love'
7.	/ma/	'below'
	/na/	'nose'
8.	/ŋa/	'I'
9.	/ya:^{h}ba/	'to go'
	/wã:^{h}bá/	'to flatter'
	/ra:^{h}/	'pond'
	/la:^{h}/	'wax seal'
10.	/dappa/	'billy can'
	/satté/	'ancient'

11.	/aʰpʰi/	'not born'
	/aʰcʰư/	'did not bark'
	/aʰkʰã́:/	'(I am) not able'
12.	/kabaé/	'kapok'
	/tidĩ/	'one year'
13.	/uída:/	'liver'
14.	/jaʰjá/	'calf of animal'
	/kʰágu/	'all'
15.	/rása/	'juice'
16.	/ã:ma/	'mother'
	/ã:ṇa/	'elder sister'
17.	/ãɳã́/	'younger sister'
18.	/lã́yã:/	'moon'
	/juwa/	'maternal uncle's wife'
	/ali/	'younger brother'
	/buwa:ri/	'sister-in-law'

19, 20 For these examples see the chart of consonant clusters that follows.

21.	/kʰrúb tam/	'it is O.K. to wash it'
	/ṭid/	'please stay'
22.	/jă:s/	'test'

23.	/ya:^{h}m/	'he goes'
	/pĩn/	'give'
	/c^{h}enle/	'well'
24.	Until better examples of syllable final /ŋ/ are obtained, it's contrastive status may be doubted:	
	/kaŋgá/	'rice fragments'
25.	/jilgé/	'rice cakes'
	/ja:^{h}r.ba/	'to bark'
26.	/pa:^{h}bá/	'to bury'
	/ti^{h}/	'occasion'
	/ṭú^{h}/	'six'
	/ci^{h}/	'small bush'
	/ko^{h}/	'upper back'
27.	/bṍ^{h}/	'strength'
	/de^{h}ró/	'now'
28.	/ḍũ^{h}ḍí/	'ear-ring worn in center of ear'
29.	/jo^{h}gá/	'baby sleeping basket'
	/ga^{h}nmasye/	'long handled wooden mallet'
30.	/sa^{h}bá/	'to heal' (intransitive)
31.	/mé^{h}/	'cow'
	/ne^{h}bá/	'to fight, tread on'
32.	/ɳe^{h}/	'milk'

33.	/pú/	'roast corn'
	/tí^{h}/	'load, bundle'
	/ṭú^{h}/	'six'
	/céna/	'sieve'
	/kó/	'blood
34.	/p^{h}úba/	'to apply medicine'
	/t^{h}ṹba/	'to drink'
	/ṭ^{h}íba/	'to strike a glancing blow'
	/c^{h}á:ra/	'new'
	/k^{h}ó/	'come!'
35.	/bṍ^{h}/	'strength'
	/dĩ́^{h}/	'house'
36.	/ḍũ^{h}ḍí/	'ear-ring worn in center of ear'
37.	/ma^{h}jâ/	'banana'
	/a^{h}gĩ́/	'eldest brother'
38.	/sṍ/	'three'
39.	/mĩ́/	'eye'
	/nílo/	'blue'
40.	/ηĩ́/	'seven'
41.	/yúl tu^{h}m/	'must come'
	/wá:^{h}/	'question particle'
	/rṍba/	'to be audible'
	/lĩ́/	'face'

Following is a chart of the syllable-initial CC-clusters which occur.

First Member:			Second Member		
	r	l	y	w	yw
p	1	2	3	4	-
p^h	5	6	7	8	-
b	9	10	11	-	-
m	12	13	14	15	-
ṭ	-	-	-	16	-
ḍ	-	-	17	-	-
c	-	-	18	19	20
c^h	-	-	21	22	23
j	-	-			
j	-	-	24	-	-
s	-	-	25	26	27
k	28	29	30	31	32
k^h	33	-	34	35	-
g	36	-	37	-	-
n	38	-	39	40	41

Numbers in the cells refer to the examples that follow.

1. /pr/	"prahq"	/prah/	'hundred'
2. /pl/	"plah"	/pla^h/	'mind'
3. /py/	"pyaah"	/pya:^{h}/	'feather'
4. /pw/	"pwiba"	/pwiba/	'to carry on back'
5. /p^hr/	"phrE"	/p^hre/	'full grown man'
6. /p^hl/	"phleba"	/p^hleba/	'to get lost'
7. /p^hy/	"phyoba"	/p^hyoba/	'to bow down'

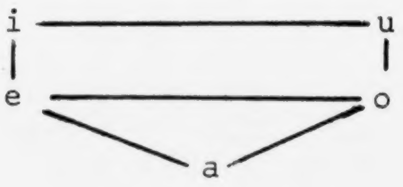
8. /p^hw/	"phwiba"	/p^hwiba/	'to blow a fire'
9. /br/	"mebroq"	/mebró/	'ashes'
10. /bl/	"tible"	/tible/	'once'
11. /by/	"byaa"	/bya:/	'wedding'
12. /mr/	"mruq"	/mrú/	'cluster'
13. /ml/	"mlah"	/mla^h/	'unhusked rice'
14. /my/	"myaaqba"	/myá:ba/	'to scour'
15. /mw/	"mwihq"	/mw$í^h$/	'rupees'
16. /tw/	"Twiba"	/ṭwìba/	'to want to follow'
17. /dy/	"Dyaahqppa"	/ḍyá:^{h}ppa/	'mechanism'
18. /cy/	"tsyO"	/cyõ/	'trap'
19. /cw/	"tswiba"	/cwiba/	'to pierce'
20. /cyw/	"tsywIba"	/cywîba/	'to tether'
21. /c^hy/	"tshyoq"	/c^hyó/	'let's go'
22. /c^hw/	"tshwiba"	/c^hwiba/	'to touch'
23. /c^hyw/	"tshyweba"	/c^hyweba/	'to sacrifice'
24. /jy/	"dzyu"	/jyu/	'life, body'
25. /sy/	"syu"	/syu/	'sheath'
26. /sw/	"swiba"	/swiba/	'to comb'
27. /syw/	"sywiba"	/sywiba/	'to roof'
28. /kr/	"kra"	/kra/	'hair'
29. /kl/	"klIq"	/klí/	'snow'
30. /ky/	"kyuq"	/kyú/	'water'
31. /kw/	"kwaalaba"	/kwa:laba/	'to heat'
32. /kyw/	"kywihq"	/kyw$í^h$/	'language'
33. /k^hr/	"khriba"	/k^hriba/	'to sprain'

34.	/kʰy/	"khyodo"	/kʰyodo/	'domestic animal'
35.	/kʰw/	"khwiqba"	/kʰwíba/	'to reform the same day'
36.	/gr/	"grihq"	/gríʰ/	'one'
37.	/gy/	"gyAAhq"	/gyâ:ʰ/	'road'
38.	/ŋr/	"ngri"	/ŋri/	'laughter'
39.	/ŋy/	"ngyohba"	/ŋyoʰba/	'to look'
40.	/ŋw/	"ngweqba"	/ŋwéba/	'to jump'
41.	/ŋyw/	"ngywiqba"	/ŋyíba/	'to ask'

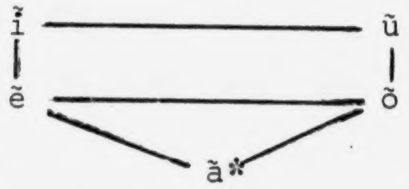
D. Vowels in Gurung

1. Contrast

Gurung may be described as having the following set of contrasting vowels.



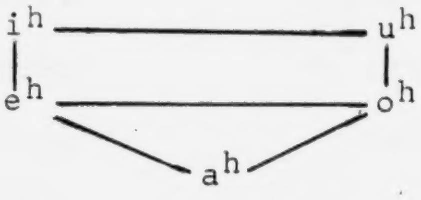
Each of these vowels may be nasal.



*Contrast for nasality in /a/ has been observed only contiguous to a nasal consonant.

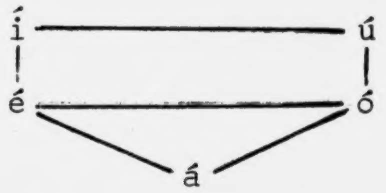
(In text orthography, nasal vowels are upper case)

Each of these vowels may be breathy.



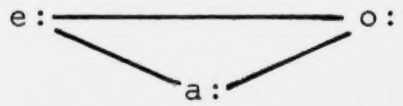
(In text orthography, breathy "h" is written on the line.)

Each may be either high or low (low is unmarked in the phonemic transcription).



(In text orthography, high is marked by postvocalic "q".)

There is contrastive length in non-high vowels. Contrastive length has not yet been observed in /i/ and /u/. There is only one example each of the long mid vowels /e:/ and /o:/.



(In text orthography length is indicated by geminate vowel clusters.)

These features intersect, yielding the following possible combinations in addition to those given above: items in parentheses have not been observed

(é:) á: (ó:) ĩ́ ẽ́ ã́ ṍ ṹ íʰ éʰ áʰ óʰ úʰ

(e:ʰ) a:ʰ (o:ʰ) ĩʰ ẽʰ ãʰ õʰ ũʰ

(é:ʰ) á:ʰ (ó:ʰ) ĩ́ʰ ẽ́ʰ ã́ʰ ṍʰ ṹʰ

(ẽ́:ʰ) ã́:ʰ (ṍ:ʰ)

On the current analysis, no vowel clusters are posited within the syllable.

Evidence for contrast in the system of vowels may be found in examples like the following:

"mi"	/mi/	'fire, tail'
"mih"	/miʰ/	'person'
"mIq"	/mĩ́/	'eye'

"moh"	/mo^h/	'brother-in-law'
"moq"	/mó/	'cane'
"mehq"	/mé^h/	'cow'
"ma"	/ma/	'below'
"muba"	/muba/	'to be'
"mIhba"	/mĩ^{h}ba/	'lemon'
"tIqba"	/tĩ́ba/	'to suckle'
"tIba"	/tĩba/	'to dip'
"tiqba"	/tibal/	'to barter'
"tiba"	/tiba/	'to spread out'
"ti"	/ti/	'corner'
"tI"	/tĩ/	'heart'
"tih"	/ti^h/	'occasion'
"teq"	/té/	'a little'
"tEq"	/tẽ́/	'cliff edge'
"teba"	/teba/	'to pour into a vessel'
"teqba"	/téba/	'to take out'
"tEba"	/tèba/	'to show'
"too"	/to:/	'wild pig'
"toq"	/tó/	'what?'
"tOq"	/tṍ/	'dish'
"tO"	/tõ/	'grain in wood'
"tOhba"	/tõ^{h}ba/	'to emerge from'

"taq"	/tá/	'axe'
"ta"	/ta/	'up'
"taahq"	/tá:^{h}/	'needle'
"taahbaq"	/ta:^{h}bá/	'to hoe, dig'
"tAAqga"	/tã́:ga/	'fish'
"tAA"	/tã:/	'word'
"tuh"	/tu^{h}/	'bucket'
"puq"	/pú/	'roast corn'
"pu"	/pu/	'part of a still'
"pih"	/pi^{h}/	'carrying basket'
"piba"	/piba/	'to be shy'
"kuq"	/kú/	'nine'
"ku"	/ku/	'human chest'
"kU"	/kũ/	'urine'
"kUh"	/kũ^{h}/	'rainshield'
"keba"	/keba/	'to itch'
"ke"	/ke/	'work'
"kE"	/kẽ/	'father-in-law'
"kAA"	/kã̀:/	'chin'
"kA"	/kã̀/	'gall bladder'
"kAAba"	/kã̀:ba/	'bitter'
"koq"	/kó/	'blood'

"kIba"	/kĩba/	'to get'
"na"	/na/	'nose'
"nAq"	/nã́/	'take'
"nah"	/na^{h}/	'ear'
"naaq"	/ná:/	'nasal mucus'
"nAAq"	/nã́:/	'rain'
"nAA"	/nã:/	'head of grain'
"no"	/no/	'lean meat'
"noh"	/no^{h}/	'pus'
"nOqba"	/nṍba/	'to press down'
"nOba"	/nõba/	'to arrange for exchange of labor'
"nOhq"	/nṍ^{h}/	'flat plot of paddy field'
"nOh"	/nõ^{h}/	'inside'

2. Variation

Two environments have been identified as responsible for variation in vowels:

a. Following bilabial or velar consonants /i/ has palatal onglide and /o/ has an extra degree of lip-rounding.

b. Under nasalization /e/ is lowered.

These may be represented as follows:

	"norm"	a	b
/i/	1.[i]	2.[^{y}i]	
/e/	3.[ɛ]	4.[^{y}ɛ]	5.[æ̃]
		6.[^{y}æ̃]	
/a/	7.[ə]		

	"norm"	a	b
/o/	8.[ɔ]	9.[ɔ̭]	
/u/	10.[u]		

The numbers in the cells above refer to the following examples.

1. [i] high front unrounded vocoid

/ciʰ/	[tsìĥ]	'tuft of grass'

2. [ʸi] high front unrounded vocoid with palatal on-glide and tongue tip held down behind lower teeth

/miʰ/	[mʸìĥ]	'person'
/kìba/	[kʸī̀ƀə̄]	'to get'

3. [ɛ] mid open front unrounded vocoid with palatal on-glide and tongue tip held down behind lower teeth

/té/	[ṱɛ́]	'a little'

4. [ʸɛ] mid open front unrounded vocoid with palatal on-glide and tongue tip held down behind lower teeth

/méʰ/	[mʸɛ̆ĥ]	'cow'
/keba/	[kʸɛ̄ƀə̄]	'to itch'

5. [æ̃] low close front unrounded vocoid (nasalized)

/nĕʰ/	[ṋæ̃̀ĥ]	'resting place'

6. [ʸæ̃] low close front unrounded vocoid with palatal on-glide and tongue tip held down behind lower teeth

/pĕ/	[pʸæ̃̄]	'tad pole'
/kẽ/	[kʸæ̃̄]	'father-in-law'

7. [ə] low close slightly backed central unrounded vocoid

/kã/	[kə̃̄]	'gall bladder'

8. [ɔ] mid open back rounded vocoid

/sṍ/	[sɔ̃́]	'three'

9. [ɔ] mid open back rounded vocoid with extra lip-rounding

/mo^{h}/	[mɔ̭^{ɦ}]	'brother-in-law'

10. [u] high close back rounded vocoid

/syu/	[šū]	'sheath'

It should be noted in passing that length contrasts are not common for vowels other than /a/. The primary manifestation of length is rearticulation of the vowel.

/t^{h}e:ba/	[ṱ^{h}ɛ̄ɛ̄ƀə̄]	'to hear'
/t^{h}eba/	[ṱ^{h}ɛ̄ƀə̄]	'to be big'
/kã:/	[kə̃̄ə̃̄]	'chin'
/kã/	[kə̃̄]	'gall bladder'

For the primary informant, there is a concomitant quality variation for long /a:/

[a] a low open central unrounded vocoid

/kã:/	[kã̄ã̄]	'chin'

3. Distribution

All five vowel qualities occur without evident restrictions in nasal, oral, clear and breathy, high and low syllables except that nasalized short /a/ has been observed only contiguous to nasal consonants, though oral and nasal do contrast in that environment.

"nAq"	/nã́/	'take (imperative)'
"na"	/na/	'nose'
"AAma"	/ã:ma/	'mother'
"AAna"	/ã:na/	'elder sister'
"AngAq"	/ãŋã́/	'younger sister'

Phonemic length (rearticulation) is very significant for the vowel /s/, but there is no evidence of rearticulation contrast for breathy vowels of the other qualities, /i, e, o, u/, and only one example of contrast for clear /e, o/ and none for clear /i, u/. A single vowel, whether long or short, forms the nucleus of the syllable.

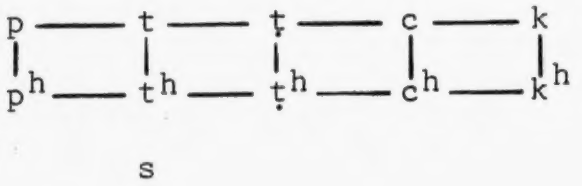
TAMANG SEGMENTAL SYNOPSIS

Doreen Taylor

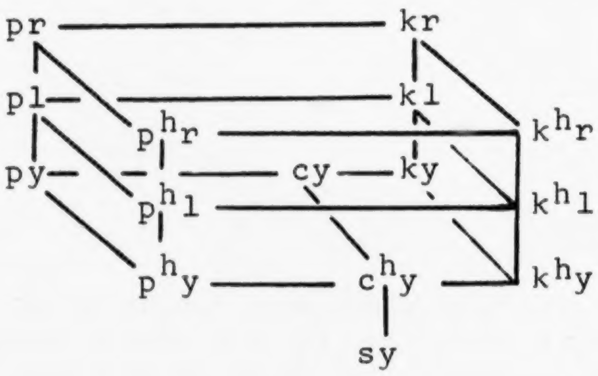
A. Obstruants

1. Contrast

Tamang may be described as having the following system of contrasting obstruants (stops, affricates and fricatives). (Segments in the diagram below are in phonemic transcription. Text orthography differs from the phonemic transcription in that phonetic voicing distinctions, though redundant with tone word-initial and with breathiness of the preceding vowel word-medial, are retained; (thus /p/ = "b" word-initial in mid and low syllables, but "p" elsewhere. Similarly, /t/ = "d", "t", /t/ = "D", "T", /c/ = "j", "c" and /k/ = "g", "k"). Upper case ("T", "D") represents retroflection, "y" following affricates and fricatives represents grooving with palatal off-glide; and aspiration /^{h}/ is written on the line: "ph", "th".)



Choosing this system of obstruants entails choosing the following system of syllable-initial clusters in which obstruants occur.



In Western Tamang there are four tones: high stressed (H), mid stressed (M), low stressed (L) and unstressed (U).

A morpheme may consist of one or more syllables of like tone or of an initial syllable with stressed tone followed by syllables with unstressed tone. (Second syllables in trisyllabic morphemes appear not to contrast for tone independently of their environment. Whether they are stressed or unstressed following a stressed initial syllable is still an unresolved problem.) Tone on examples is represented as follows: For monosyllabic morphemes and for polysyllabic morphemes all syllables of which have the same stressed tone, tone is marked morpheme-finally in text orthography by the symbols:

"-q" 'high tone'
"-g" 'mid tone'
"-'" 'low tone'

Unstressed tone is unmarked.

The letter "g" appears morpheme finally not only as a marker of mid tone but also as part of the digraph "ng" which represents the phoneme /ŋ/. To distinguish the "g" of "ng" from the "g" that marks mid tone, we underline the digraph in the text. A non-underlined "g" word-finally is thus always a tone mark. Polysyllabic morphemes which have stressed tone initially and unstressed tone finally are marked as such by a colon before the syllable-final tone mark. In phonemic transcription vowels are marked for tone: /´/ for high stressed tone /¯/ for mid stressed tone /`/ for low stressed tone and unmarked for unstressed. These conventions are summarized for disyllabics in the following chart.

HH	"-q"	/´´/
HU	"-:q"	/´ /
MM	"-g"	/¯¯/
MU	"-:g"	/¯ /
LL	"-'"	/``/
LU	"-:'"	/` /
UU	" "	/ /

Note that in the phonemic transcription /:/ represents vowel length whereas in the text orthography ":" represents an unstressed morpheme-final syllable.

Evidence for contrast among obstruant phonemes is to be found in examples such as the following:

"paig-pa"	/pāī-pa/	'bring down'
"pai"	/pai/	'wool
"phaiq"	/p^háĭ/	'iron'
"khaiq-pa"	/k^háí-pa/	'wind thread' (Pres)
"pii-pa"	/pi:-pa/	'be wet with mud' (Pres)
"p^hii-pa"	/p^hi:-pa/	'sprout' (Pres)
"tong"	/toŋ/	'up'
"thongq"	/t^hóŋ/	'vessel for milk'
"taaq"	/tá:/	'what'
"thaakang"	/t^ha:kaŋ/	'loom part'
"Tiq-pa"	/ṭí-pa/	'sit' (Pres)
"Thil"	/$ṭ^h$il/	'a loom rod'
"Tanga"	/ṭaŋa/	'half a rupee'
"Thaarq"	/$ṭ^h$á:r/	'a leaf plate'
"kaaq"	/ká:/	'blood'
"khaaraq"	/k^há:rá/	'throat'
"kolaq"	/kólá/	'child'
"khore:q"	/k^hóre/	'a small dish'
"cang"	/caŋ/	'elder brother's wife'
"chang"	/c^haŋ/	'a basket'
"ta-pa"	/ta-pa/	'be' (Pres)
"Taa'-pa"	/ṭà:-pa/	'win' (Pres)

	"ca-pa"	/ca-pa/	'eat' (Pres)
	"sa"	/sa/	'earth'

The following are examples of clusters in which stops occur.

pr	"prang"	/praŋ/	'stand over' (fire place)
	"bretg"	/prēt/	'eight'
pl	"pleng"	/pleŋ/	'edible frong'
	"blig"	/plī/	'four'
py	"byo'"	/pyò/	'a bamboo mat'
	"pyantala:q"	/pyántala/	'butterfly'
$p^h r$	"phrengkaq"	/p^hréŋká/	'a necklace'
$p^h l$	"phlik-pa"	/p^hlik-pa/	'flash' (Pres)
$p^h y$	"phyaaq"	/p^hyá:/	'broom'
cy	"cyaa-pa"	/cya:-pa/	'see' (Pres)
$c^h y$	"chyong-pa"	/c^hyoŋ-pa/	'run' (Pres)
kr	"gren'"	/krèn/	'eldest'
	"kra"	/kra/	'head'
kl	"gleg"	/klē/	'clan name'
	"klang-pa"	/klaŋ-pa/	'play' (Pres)
ky	"gyuug"	/kyū:/	'sour' (Pres)
$k^h r$	"khrangq-pa"	/k^hráŋ-pa/	'burn' (Pres)
$k^h l$	"khlaa-pa"	/k^hla:-pa/	'throw away' (Pres)
$k^h y$	"khya-pa"	/k^hya-pa/	'glue' (Pres)

sy	"sya-pa"	/sya-pa/	'dance' (Pres)

2. Variation

Seven sets of environments have been identified as responsible for variation in obstruants. They are as follows: (Tone in phonetic examples is omitted in sections dealing with segmentals. The phonetic pitch of monosyllables in isolation is of little significance for our purposes in this section.)

1. In word-initial position.

   a. In a high or unstressed syllable (_v́) (v)

   b. In a low or mid syllable (_v̀), (_v̄)

   c. Before a front vowel (_e), (_i)

   d. Before the glide (_y)

2. In word-medial position.

   e. Following a breathy vowel ($v^{ɦ}$_)

   f. Following a clear vowel (v_)

   g. Following a clear vowel and /r, l, m, n/ or /ŋ/

3. In word-final position

   h. All instances.

Variants for aspirated stops are parallel to those for unaspirated stops, thus are not listed separately. In the following chart the columns are labeled according to the environments listed above, the rows are labeled according to segment-type. The cells contain variants of the segment types identified in the various environments. Numbers in the cells refer to the examples that follow.

Note that environment (d) intersects with environments (a) and (b) and therefore is charted below on the vertical axis.

		a	b	c	d
"p"	/p/	1.[p]	2.[b]		
"t"	/t/	7.[ṱ]	8.[ḓ]		
"T"	/ṭ/	12.[ṭ]	13.[ḍ]		
"c"	/c/	14.[ts]	15.[dz]	16.[ṱs],[ḓz]	17.[tš],[dž]
"k"	/k/	21.[k]	22.[g]		
"s"	/s/	27.[s]	28.[s]		29.[š]

		e	f	g	h
"p"	/p/	3.[b]	4.[p̤]	5.[p̤/b̤]	6.[p˺]
"t"	/t/		9.[t̤]	10.[đ̭]	11.[ṱ$^{\theta}$]
"c"	/c/	18.[dz]	19.[ts/dz]	20.[ts/dz]	
"k"	/k/	23.[g]	24.[k̤]	25.[k̤/g̤]	26.[k˺]
"s"	/s/			30.[s]	31.[s]

1. [p] voiceless bilabial stop

/pi^{ŋ}/	[pɪŋ]	'blue'

2. [b] voiced bilabial stop

/pū/	[bu]	'field'

3. [b] voiced bilabial stop

/pé^{h}-pa/	[pe$^{\hat{h}}$ba]	'separate' (Pres)

4. [p̤] lax voiceless bilabial stop

/ípí/	[ip̤i]	'enemy'

5. [p̤/b̤] lax voiceless bilabial stop in fluctuation with lax voiced bilabial stop

/pàlpa/	[balp̤a/balb̤a]	'frog'

6. [p'] voiceless unreleased bilabial stop

/ṭup/	[ṭup']	'thread'

7. [ṱ] voiceless apico-dental stop

/ta:/ [ṱa:] 'what'

8. [ḓ] voiced apico-dental stop

/tà/ [ḓa:] 'an upright post'

9. [t̤] lax voiceless apico-dental stop

/ā-ta-pa/ [at̤apa] 'not allowed' (Pres)

10. [đ̭] voiced apico-dental fricative

/rilto/ [rɩlđ̭o] 'circle'

11. [ṱ$^{\theta}$] voiceless apico-dental stop with fricative release

/pot/ [poṱ$^{\theta}$] 'bone'

12. [ṭ] voiceless apico-alveolar stop

/ṭup/ [ṭup˺] 'thread'

13. [ḍ] voiced apico-alveolar stop

/ḍò:-pa/ [ḍo:pa] 'run away' (Pres)

14. [ts] voiceless alveolar affricate

/caŋ/ [tsaŋ] 'elder brother's wife'

15. [dz] voiced alveolar affricate

/cà/ [dza] 'son'

16. [ṱs] voiceless dental affricate

/cí/ [ṱsi] 'ten'

[ḓz] voiced dental affricate

/jìr/ [ḓzir̂] 'hookah plug'

17. [tš] voiceless alveolar grooved affricate

/cyám/ [tš^{y}am] 'urine'

[dž] voiced alveolar grooved affricate

/cyà-pa/ [dž^{y}a-pa] 'good' (Pres)

18. [dz] voiced alveolar affricate

/nē^{h}n-ci/ [ne$^{\hat{h}}$n-ḓzi] 'cover'

(This example illustrates voicing after breathy vowels. The fronting of the affricate is conditioned by the following /i/.)

19. [ts/dz] voiced alveolar affricate in fluctuation with voiceless alveolar affricate

/ɳa-ce/ [ɳa-t͓se/ɳa-ḓze]'cover' (Past)

(This example illustrates fluctuation in voicing, the fronting is conditioned by the following front vowel.)

20. [ts/dz] voiced alveolar affricate in fluctuation with voiceless alveolar affricate.

/tunca/ [tuntsa/tundza] 'short'

21. [k] voiceless velar stop

/két/ [ket$^{\theta}$] 'voice'

22. [g] voiced velar stop

/kī:/ [gi:] 'one'

23. [g] voiced velar stop

/sà^{h}kù/ [sa$^{\hat{h}}$gu] 'dirty' (of water)

24. [k̤] lenis voiceless velar stop

/naki/ [nak̤i] 'dog'

25. [k̤/g̤] lenis voiceless velar stop in fluctuation with lenis voiced velar stop.

/sal-ke/ [sal-k̤e/sal-g̤e] 'may I open'

26. [k˺] unreleased voiceless velar stop

/cek/ [ṱsek˺] 'a little'

27. [s] voiceless alveolar fricative

/sa/ [sa] 'tooth, ground'

28. [s] voiceless alveolar fricative

/sìnsòr/ [sɪnsor̂] 'bee'

29. [š] voiceless alveolar grooved fricative

/sya/	[š^{y}a]	'meat'

30. [s] voiceless alveolar fricative

/kānsā/	[gansa]	'red clay'

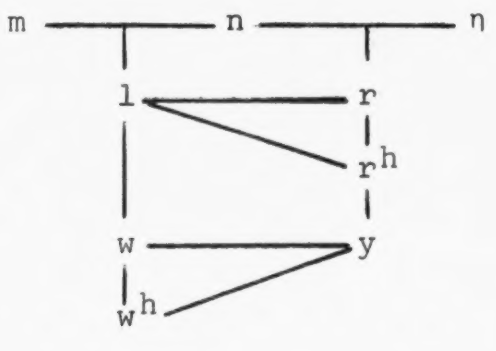
31. [s] voiceless alveolar fricative

/nyis/	[n̂^{y}ɩs]	'seven'

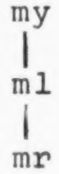
B. Sonants in Tamang

1. Contrast

Tamang may be described as having the following system of sonants.



entailing the following system of clusters in syllable-initial position



The diagrams above are given in phonemic transcription. The orthography for texts differs only in that /ŋ/ is written "ng", and /^{h}/ is written on the line "wh", "rh".

Evidence for contrast among the nasal consonants is found in examples such as the following:

"ama"	/ama/	'mother'
"anaq"	/ánâ/	'elder sister'

"nyeh'"	/nyèʰ/	'milk'
"meʰg"	/mēʰ/	'cow'
"nyah'-pa"	/nyàʰ-pa/	'cry out' (Pres)
"naq-pa"	/ná-pa/	'pain' (Pres)
"ngah'"	/ŋàʰ/	'a drum'
"maah'"	/mà:ʰ/	'sister's husband'
"na"	/na/	'nose'

Evidence for contrast among liquids and glides is found in examples such as the following:

"la"	/la/	'god'
"ra"	/ra/	'goat'
"wa"	/wa/	'fish trap'
"yaa'-pa"	/yà:-pa/	'fade' (Pres)
"yaa"	/ya:/	'hand'
"wha-pa"	/wʰa-pa/	'dig' (Pres)
"reeq-pa"	/ré:-pa/	'roost' (Pres)
"rheeq-pa"	/rʰé:-pa/	'raise' (Pres)

The following are examples of clusters in which nasals occur:

my	"myar-pa"	/myar-pa/	'flood' (Pres)
ml	"mlangq"	/mláŋ/	'black'
	"mla-ken"	/mla-ken/	'cooked rice'
mr	"mraangq"	/mráŋ/	'garden'
	"mring"	/mriŋ/	'wife'

2. Variation

Relatively little variation has been observed in

Tamang nasals, liquids and glides. Deviation from the norm has been observed only for /r/, /n/ /w/. There are six environments that condition variation. We give below only those non-norm variants that have been observed. Numbers in the cells refer to the following examples.

a. Word-Initial

b. Word-Medial

c. Word-Medial before /ṭ/, /s/ and intervocalic

d. Word-Final

e. Word-Initial before /e/

f. Before the glide /y/

	a	b	c	d	e	f
"r" /r/	1.[r̂]	2.[ř]		1.[r̂]		
"n" /n/	3.[ṋ]		4.[n]	3.[ṋ]		5.[ṅ]
"y" /y/					6.[y/w/wy]	

1. [r̂] voiced alveolar trilled liquid

/ra/	[r̂a]	'goat'
/mār/	[mar̂]	'gold

2. [ř] voiced alveolar flapped liquid

/prā:/	[břa:]	'flour'
/ārē/	[aře]	'no'

3. [n̂] voiced dental nasal

/na/	[ṋa]	'nose'
/sun/	[suṋ]	'uncooked rice'
/ântár/	[aŋṱar̂]	'middle'

4. [n] voiced alveolar nasal

/gànṭu/	[ganṭu]	'dried raddish'
/pin-o/	[pɪno]	'give!'
/kānsā/	[gansa]	'red clay'

5. [ñ] voiced palatal glide

/nyè^h/	[ñe^ɦ]	'milk'

6. [y] voiced alveo-palatal glide in fluctuation with

[w] voiced bilabial glide and

[wy] voiced bilabial glide with alveo-palatal release

/yén/	[yen/wen/wyen]	'cloth'
/yēt/	[yet/wet/wyet]	'eagle'

Norms are described for phonemes with only one observed variant in the following:

/m/	[m]	voiced bilabial nasal
/ŋ/	[ŋ]	voiced dorso velar nasal
/l/	[l]	voiced alveolar lateral
/r^h/	[r^h]	voiced aspirated alveolar vibrant
/w^h/	[w^h]	voiced aspirated bilabial glide
/w/	[w]	voiced unaspirated bilabial glide

C. Distribution of Consonants in Tamang

All consonants occur alone in syllable initial position. Labial and velar stops and /m/ occur as the first member of syllable-initial CC-clusters, the second member of which may be /l/, /r/ or /y/. So far no CCC-clusters have been found within the syllable.

In syllable-final position we have found /p/, /t/. /k/, /s/, /m/, /n/, /ŋ/, /l/, and /r/. Syllable-final position thus excludes aspirates, affricates, retroflex stops and glides. It also excludes clusters.

The following chart summarizes the syllable-initial CC-clusters found to occur in Tamang. Numbers in the cells refer to the examples that follow.

first member	second member		
	/l/	/r/	/y/
/p/	1	2	3
/p^{h}/	4	5	6
/k/	7	8	9
/k^{h}/	10	11	12
/m/	13	14	15

1.	"plaa-pa"	/pla:-pa/	'slip' (Pres)
2.	"prooq"	/pró:/	'light meat'
3.	"byo'"	/pyò/	'a bamboo mat'
4.	"phlik-pa"	/p^{h}lik-pa/	'flash' (Pres)
5.	"phrengkaq"	/p^{h}réŋká/	'a necklace'
6.	"phyang-pa"	/p^{h}yaŋ-pa/	'fly' (Pres)
7.	"klang-pa"	/klaŋ-pa/	'play' (Pres)
8.	"kring-pa"	/kriŋ-pa/	'cry out' (Pres)
9.	"kyung-pa"	/kyuŋ-pa/	'lemon'
10.	"khlaa-pa"	/k^{h}la:-pa/	'throw away' (Pres)
11.	"khrangq-pa"	/k^{h}ráŋ-pa/	'burn' (Pres)
12.	"khyang"	/k^{h}yaŋ/	'platform'
13.	"mlangq"	/mláŋ/	'black'
14.	"mring"	/mriŋ/	'wife'
15.	"myuhrq"	/myú^{h}r/	'overflow'

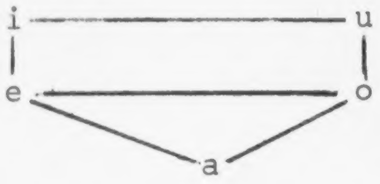
The following are examples of the consonants found so far in syllable-final position.

p	"Tup"	/ṭup/	'thread'
t	"netq"	/nét/	'full'
k	"tak"	/tak/	'seventh year'
s	"basto'"	/bàstò/	'animal'
m	"syim"	/šim/	'cool'
n	"suṅ"	/sun/	'unhusked rice'
η	"kah̲g̲"	/kaη/	'foot'
l	"yaḣl'"	/yàhl/	'sunlight'
r	"baṙkug"	/bārkū/	'woman's garment'
	"toṙ"	/tor/	'up'

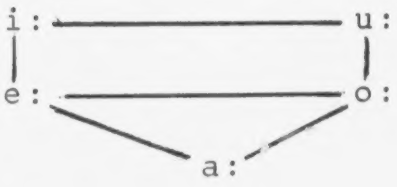
D. Vowels in Tamang

1. Contrast

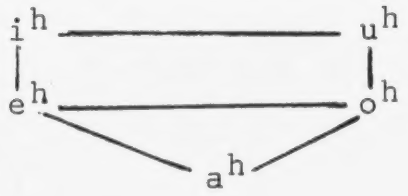
Tamang may be described as having the following system of contrasting vowels:

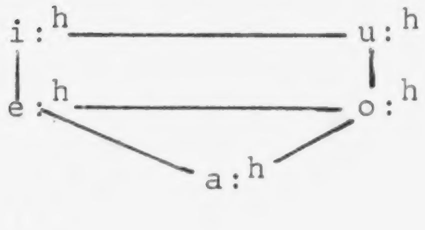


For each quality there is a short vowel (above) and a long vowel:



For each quality and length there are clear vowels (above) and breathy vowels:





In a very few cases nasal vowels have also been found:

ẽ

ã

All vowel clusters are disyllabic. There is thus no clustering of vowels within the syllable. Diagrams above are given in phonemic transcription. Text orthography differs from the phonemic transcription in that long vowels are written as a geminate cluster /o:/ = "oo" and the /^{h}/ for breathiness is written on the line /e^h/ = "eh". Nasal /ẽ/ = "e;".

Evidence for contrast in the system of vowels may be found in examples like the following:

a. Vowel quality

"me"	/me/	'fire'
"mee"	/me:/	'tail'
"miih'"	/mì:^{h}/	'man'
"miiq"	/mí:/	'eye'
"maah'"	/mà:^{h}/	'sister's husband'
"phoq"	/p^{h}ó/	'stomach'
"phaq"	/p^{h}á/	'husband'
"phiiq"	/p^{h}í:/	'bark'

"cho"	/c^{h}c/	'rope'
"chiq"	/c^{h}í/	'grass, fat'
"kiq"	/kí/	'water'
"kuq"	/kú/	'vegetable'
"laq"	/lá/	'month'
"leq"	/lé/	'tongue'
"la"	/la/	'god'
"le"	/le/	'ear of wheat'
"liiq"	/lí:/	'face'
"lah'"	/là^{h}/	'mountain'
"rii-pa"	/ri:-pa/	'scratch' (Pres)
"raa-pa"	/ra:-pa/	'weave' (Pres)
"syee-pa"	/še:-pa/	'know' (Pres)
"syoo-pa"	/šo:-pa/	'beg' (Pres)
"rup-pa"	/rup-pa/	'vomit' (Pres)
"rep-pa"	/rep-pa/	'grind spices' (Pres)
"ru"	/ru/	'horn'
"ra"	/ra/	'goat'
"naah'"	/nà:^{h}/	'pus'
"nuuh'"	/nù:^{h}/	'large wasp'
"puu'"	/pù:/	'soul'
"paa"	/pà:/	'leaf'
"na"	/na/	'nose'
"no"	/no/	'also'
"khoq"	/khó/	'pig pen, trip'
"khuq"	/khú/	'cooked vegetable'

"doo'-pa"	/tò:-pa/	'arrive' (Pres)
"duu'-pa"	/tù:-pa/	'be tired' (Pres)

b. Length

"gig"	/kī/	'thatch'
"giig"	/kī:/	'one'
"me"	/me/	'fire'
"mee"	/me:/	'tail'
"sa"	/sa/	'tooth, soil'
"saaq"	/sá:/	'breath'
"taa-pa"	/ta:-pa/	'hold hand out' (Pres)
"ta-pa"	/ta-pa/	'be' (Pres)
"goo'-pa"	/kò-pa/	'remove crust from pot' (Pres)
"go'-pa"	/kò-pa/	'understand' (Pres)
"bug"	/pū/	'field'
"buug"	/pū:/	'labored breathing'

c. Breathiness

"lah'"	/làʰ/	'mountain'
"laahg"	/lā:ʰ/	'a flower'
"laq"	/lá/	'month'
"la"	/la/	'god'
"miiq"	/mí:/	'eye'
"miih'"	/mì:ʰ/	'man'
"ngoh'"	/ŋòʰ/	'forehead'
"ngoog"	/ŋō:/	'tease, provide'
"eeg"	/ē:/	'you'

"eeh'"	/è:^{h}/	'eighth year'
"me"	/me/	'fire'
"mehq"	/mē^{h}/	'cow'
"kuuq-pa"	/kű:-pa/	'be cloudy'
"kuuhq-pa"	/kű:^{h}-pa/	'bend'

d. Nasalization

Nasalized vowels are very rare. Only three instances of nasalization not attributable to adjacent nasal consonants have been recorded.

"Theewa;:q"	/ṭ^{h}é:wã/	'green'
"blee;sying'"	/plẽ̀:šìŋ/	'a flower'
"pee;peq"	/pẽ́:pé/	'a fruit'

2. Variation

Relatively little variation has been observed in Tamang vowels. Three environments are identified as relevant to vowel variation.

a. closed syllables

b. closed syllables of the form: /Cy_l/
/Cy_r/

where initial C is optional

	a	b	elsewhere
"i" /i/	1.[ι]		2.[i]
"a" /a/		3.[æ]	4.[a]

These variants are illustrated in the following:

1. [ι] voiced high open front unrounded vocoid

/tīm/	[ḓιm]	'house'
/min/	[mιn]	'name'

/šim/	[šʸım]	'cool'

2. [i] voiced high close front unrounded vocoid

/cí/	[ṱsi]	'ten'
/kí/	[ki]	'water'

3. [æ] voiced low close front unrounded vocoid

/nyal-pa/	[n̂ʸæl-pa]	'chew cud' (Pres)
/myar-pa/	[mʸæř-pa]	'flood' (Pres)
/šar/	[šʸær]	'east'
/yàʰl/	[yæʱl]	'sunlight'

4. [a] voiced low central unrounded vocoid

/yàʰm/	[yaʱm]	'very ill'
/yap-pa/	[yap˺-pa]	'winnow' (Pres)
/šaŋ/	[šʸaŋ]	'a small bell'
/n̂àʰ-pa/	[n̂ʸaʱ-ba]	'cry out' (Pres)

Norms are described below for vowels with only one observed variant in the following:

/i:/ [i:] long high front unrounded clear vocoid

/pʰi:/	[pʰi:]	'bark, rind'

/iʰ/ [iʰ] short high front unrounded breathy vocoid

/lìʰ-pa/	[liʱ-ba]	'heavy'

/i:ʰ/ [i:ʰ] long high front unrounded breathy vocoid

/mì:ʰ/	[mi:ʱ]	'man'

/e/ [e] short mid-front unrounded clear vocoid

/me/	[me]	'fire'

/e:/ [e:] long mid-front unrounded clear vocoid

/me:/	[me:]	'tail'

/eʰ/	[eʰ]	short mid front unrounded breathy vocoid	
	/mèʰ/	[meʱ]	'cow'
/e:ʰ/	[e:ʰ]	long mid front unrounded breathy vocoid	
	/'è:ʰ/	['e:ʱ]	'8th year'
/a/	[a]	short low central clear vocoid	
	/sa/	[sa]	'tooth, ground'
/a:/	[a:]	long low central clear vocoid	
	/tá:/	[ta:]	'eleventh, year, what'
/aʰ/	[aʰ]	short low central breathy vocoid	
	/làʰ/	['laʱ]	'mountain'
/a:ʰ/	[a:ʰ]	long low central breathy vocoid	
	/'mà:ʰ/	['ma:ʱ]	'sister's husband'
/u/	[u]	short high back rounded clear vocoid	
	/pū/	[bu]	'field'
/u:/	[u:]	long high back rounded clear vocoid	
	/pū:/	[bu:]	'laboured breathing'
/uʰ/	[uʰ]	short high back rounded breathy vocoid	
	/mūʰk-pa/	[muʱk-ba]	'damp cloth' (Pres)
/u:ʰ/	[u:ʰ]	long high back rounded breathy vocoid	
	/'lù:ʰ-pa/	['lu:ʱ-ba]	'pour from one vessel to another' (Pres)
/o/	[o]	short mid back rounded clear vocoid	
	/tor/	[tor]	'up'
/o:/	[o:]	long mid back rounded clear vocoid	
	/próo/	[přoo]	'light meal'
/oʰ/	[oʰ]	short mid back rounded breathy vocoid	
	/'ŋòʰ/	['ŋoʱ]	'forehead'

/o:^{h}/ [o:^{h}] long mid back rounded breathy vocoid

/'rò:^{h}/ ['ro:^{ɦ}] 'friend'

3. Distribution

Since all VV clusters contain two syllabic peaks and are thus disyllabic, very little need be said at this point regarding the distribution of vowels within the syllable.

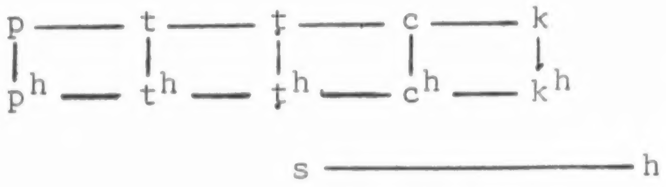
THAKALI SEGMENTAL SYNOPSIS

Maria Hari

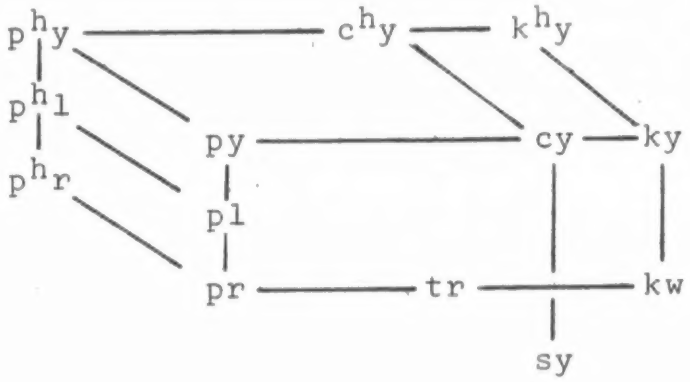
A. Obstruants in Thakali

1. Contrast

Thakali may be described as having the following system of contrasting obstruants. (The segments in the diagram are those of the phonemic transcription. The text orthography differs slightly in that /ṭ/ = "T", /ṭ^h/ = "Th" and aspiration is written on the line "h".)



Choosing this system of obstruants entails choosing the following system of syllable-initial clusters in which obstruants occur.



Evidence for contrast in the system of obstruants may be found in the following examples:

"phi"	/p^{h}i/	'bark'
"pi"	/pi/	'leaves'
"thiwa"	/t^{h}iwɔ/	'to throw up'
"tiwa"	/tiwɔ/	'to spread'
"Thuwa"	/ṭ^{h}uwɔ/	'to wash'
"'Thuwa"	/'ṭuwɔ/	'to stay'
"choy"	/c^{h}oy/	'limit'

"coy"	/coy/	'remains'
"khiwa"	/k^{h}iwɔ/	'to bind'
"kiwa"	/kiwɔ/	'easy'
"saang"	/saŋ/	'incense'
"haang"	/haŋ/	'courtyard'
"'suwa"	/'suwɔ/	'dense'
"syuwa"	/syuwɔ/	'to line up'
"su"	/su/	'who'
"sa"	/sɔ/	'tooth, earth'
"phewa"	/p^{h}ewɔ/	'to come out'
"pewa"	/pewɔ/	'shy'
"thewa"	/t^{h}ewɔ/	'to hear'
"tewa"	/tewɔ/	'to fall'
"Thewa"	/ṭ^{h}ewɔ/	'to tear up'
"Tewa"	/ṭewɔ/	'to climb'
"Thuwa"	/ṭ^{h}uwɔ/	'to wash'
"'Tuwa"	/'ṭuwɔ/	'to stay'
"chuwa"	/c^{h}uwɔ/	'entertaining'
"cuwa"	/cuwɔ/	'bark'

The following are examples of the clusters posited by this analysis:

py	"pyung"	/pyuŋ/	'man'
pl	"plaa"	/pla/	'vegetable'
pr	"'preh"	/'pre^{h}/	'eight'
tr	"truhma"	/tru^{h}mɔ/	'next year'

ky	"kyu"	/kyu/	'water'
kw	"kwaahri"	/kwa^{h}ri/	'up there'
phy	"phyongpa"	/p^{h}yoŋpɔ/	'to jump'
phl	"phle'la"	/p^{h}le'lɔ/	'to open up'
khy	"khyaawa"	/k^{h}yawɔ/	'to throw away'
cy	"cyaangpa"	/cyaŋpɔ/	'small'
chy	"chyaarwa"	/c^{h}yarwɔ/	'sharp'
sy	"sya"	/syɔ/	'meat'

2. Variation

Nine sets of environments have been identified as responsible for variation in obstruants. These environments form two intersecting subsets in that one set of conditions specifies the position of the obstruant in relation to general classes such as vowels, voiced consonants and voiceless consonants, whereas the other set specifies position of the obstruant in terms of particular vowel qualities which follow. The variation produced by these two sets of environments is effected independently.

1) Environments influencing point of articulation

A. "Norm" /_ a, u, o, a^h, u^h, o^h /

B. Fronting /_ i, e, y, i^h, e^h /

C. Backing /_ ɔ, ɔ^h /

D. Labial Release #/_ o, o^h /

(Read: word-initial before o, o^h). Environment D applies only to /k/. Environment C is relevant for /k/ and /k^h/. Environments A and B are relevant for /k^h/, /c/, /k/ and /s/.

2) Environments affecting tenseness, laxness, voicing

E. Tense variant: (norm): word-initial

F. Tense variant: (norm): word-final

G. Tense variant: (norm): contiguous to voiceless consonant

H. Voiced variant: following voiced consonant

I. Lenis variant: following vowel before voiced consonant

J. Lenis variant: intervocalic

The first set is represented by rows lettered A, B, C as appropriate, the second set by columns lettered E-F. In the cells are the broad phonetic values of the variants. Numbers in the cells refer to the examples that follow. A hyphen in a cell indicates that either 1) the segment does not occur in this environment (see the statement on distribution of consonants below) or that no deviation from the norm is conditioned by this environment.

	"Norm"			Voiced	Lenis	
	E	F	G	H	I	J
	Initial	Final	_vlC vlC_	vdC_	V_vdC	V_V
/pʰ/	1.[pʰ]	-	-	-	-	2.[ᵽ]
/tʰ/	3.[ṱʰ]	-	-	-	-	-
/ṭʰ/	4.[ṭʰ]	-	-	-	-	-
/cʰ/	5.[tsʰ]	-	-	-	-	-
/kʰ/A.	6.[kʰ]	-	-	-	-	7.[kʰ∼x̣]
B.	8.[k̭ʰ]	-	-	-	-	9.[k̭ʰ∼x̭̤]
C.	10.[ḳʰ]	-	-	-	-	11.[ḳʰ∼x̣̤]
/p/	12.[p]	13.[p]	-	14.[b]	15.[p̤]	16.[p̤∼ƀ]
/t/	17.[ṱ]	18.[t͓]	-	19.[d͓]	20.[ṱ̤]	21.[ṱ̤]
/ṭ/	22.[ṭ]	-	23.[ṭ]	24.[ḍ]	-	25.[ṭ̤]
/c/A.	26.[ts]	-	27.[ts]	28.[dz]	-	29.[ts̤∼dz]
B.	30.[ṱš]	-	31.[ṱš]	32.[ḓž]	-	33.[ṱš∼ḓž]
/k/A.	34.[k]	35.[k]	36.[k]	37.[g]	38.[k̤]	39.[k̤∼g]

	E	F	G	H	I	J
B.	40.[k͓]	-	41.[k̭]	-	-	42.[k̤∼g̭]
C.	43.[ḳ]	-	44.[ḳ]	-	-	45.[k̹∼g̣]
D.	46.[kʷ]	-	-	-	-	-
/s/A.	47.[s]	-	-	-	-	-
B.	48.[š͓]	-	-	-	-	-
/h/	49.[h]	-	-	-	-	-

[pʰ] voiceless aspirated, bilabial stop

1. /pʰo/ [pʰo] 'stomach'

[pʰ] voiceless aspirated bilabial stop in fluctuation with

[ᵽ] voiceless bilabial fricative

2. /'apʰi/ [?apʰi/?aᵽi] 'aunt'

[t͓ʰ] voiceless aspirated alveo dental stop

3. /tʰoroŋ/ [tʰořoŋ] 'first'

[ṭʰ] voiceless aspirated alveopalatal stop

4. /ṭʰicɔm/ [ṭʰiṭsɔm] 'only'

[tsʰ] voiceless aspirated alveolar affricate

5. /cʰoŋ/ [tsʰoŋ] 'business'

[kʰ] voiceless aspirated velar stop

6. /kʰa/ [kʰa] 'neck'

[kʰ] voiceless aspirated velar stop in fluctuation with

[x̤] voiceless lax velar fricative

7. /tikʰum/ [ṱikʰum/ṱix̤um] 'one pice'

[k̭ʰ] voiceless aspirated front velar stop

8. /kʰiwɔ/ [k̭ʰiwɔ] 'bind'

6

[k̭ʰ] voiceless aspirated front velar stop in fluctuation with

[x̭̤] voiceless lax front velar fricative

9. /akʰi/ [ʔak̭ʰi/ʔax̭̤i] '(I) don't bind'

[ḳʰ] voiceless aspirated back velar stop

10. /'kʰɔwɔ/ [ḳʰɔwɔ] 'to come'

[ḳʰ] voiceless aspirated back velar stop in fluctuation with

[x̣̤] voiceless lax back velar fricative

11. /'akʰɔ/ [ʔaḳʰɔ/ʔax̣̤ɔ] '(I) don't come'

[p] voiceless bilabial stop

12. /pe/ [pe] 'story'

13. /łɔp/ [łɔp] 'hot'

[b] voiced bilabial stop

14. /sɔmpɔ/ [sɔmbɔ] 'new'

[p̤] voiceless lax bilabial fricative

15. /'poplo/ [pop̤lo] 'shoe'

[p̤] voiceless lax bilabial fricative in fluctuation with

[ƀ] voiced bilabial fricative

16. /'lɔpu/ [lɔp̤u/lɔƀu] 'radish'

[ṱ] voiceless alveodental stop

17. /tom/ [ṱom] 'bear'

18. /cɔt cɔt/ [tsɔṱ tsɔṱ] 'frying noise'

[ḓ] voiced alveodental stop

19. /meʰnto/ [meʰ̂nḓo] 'flower'

[ṱ̤] voiceless lax alveodental stop

20. /kutru/ [kuṱ̤řu] 'hunch bucket'

21. /'oʰte/ [ʷʰoʰṱ̤e] 'so much'

[ṭ] voiceless alveopalatal stop

22. /'ṭuʰn/ [ṭuʰn] 'tree'

23. /pʰopṭe/ [pʰopṭe] 'gray'

[ḍ] voiced alveopalatal stop

24. /konṭa/ [kʷonḍa] 'loom'

[t̤] voiceless lax alveopalatal stop

25. /nɔṭi/ [nɔt̤i] 'bone'

[ts] voiceless alveolar affricate

26. /cɔm/ [tsɔm] 'bridge'

27. /caŋ/ [tsaŋ] 'daughter-in-law'

[dz] voiced alveolar affricate

28. /momcaʰ/ [momdzaɦ] 'grandmothers'

[t̤s] voiceless lax alveolar affricate in fluctuation with

[dz] voiced alveolar affricate

29. /pucu/ [put̤su/pudzu] 'thorn'

[ṱš] voiceless alveodental affricate

30. /'cyuku/ [ṱšyük̤u] 'oil'

31. /toʰkci/ [ṱoɦkṱši] 'arrived'

[ḓž] voiced alveodental grooved affricate

32. /mɔnce/ [mɔnḓže] 'by the medicine'

[ṱ̤š] voiceless lax alveodental grooved affricate in fluctuation with

[ḓž] voiced alveodental grooved affricate

33. /sici/ [ciṱ̤ši/siḓži] 'died'

[k] voiceless velar stop

34. /ka/ [ka] 'blood'

35. /toʰk/ [ṱoʰk] 'arrives'

36. /toʰkpɔ/ [t͓oʰkpɔ] 'to arrive'

[g] voiced velar stop

37. /saŋkye/ [saŋg͓ye] 'heaven'

[k̤] voiceless lax velar stop

38. /toʰklɔ/ [ṱoʰ̂k̤lɔ] 'did (you) arrive?'

[k̤] voiceless lax velar fricative in fluctuation with

[g] voiced velar fricative

39. /naka/ [nãk̤a/nãga] 'hen'

[k͓] voiceless front velar stop

40. /kiwɔ/ [k̭iwɔ] 'well, easy'

41. /riʰkpɔ/ [r·iʰkpɔ] 'wisdom'

[k̭̤] voiceless lax front velar stop in fluctuation with

[g͓] voiced front velar fricative

42. /akiwɔ/ [ʔak̭̤iwɔ/ʔag̭iwɔ] 'uneasy'

[ḳ] voiceless back velar stop

43. /'kɔplo/ [ḳɔp̤lo] 'scull'

44. /kwɔʰkte/ [kwɔʰ̂ḳṱe] 'silly thing'

[ḳ̤] voiceless lax back velar stop in fluctuation with

[g̣] voiced back velar fricative

45. /'nokɔr/ [nõk̤ɔr̽/nõg̣ɔr̽] 'cat'

[kʷ] voiceless velar stop with bilabial release

46. /'koʰy/ [kʷoʰ̂y] 'song'

[s] voiceless alveodental fricative

47. /saŋ/ [saŋ] 'incense'

[s͓̭] voiceless alveopalatal grooved fricative

48. /sye/ [s͓ye] 'louse'

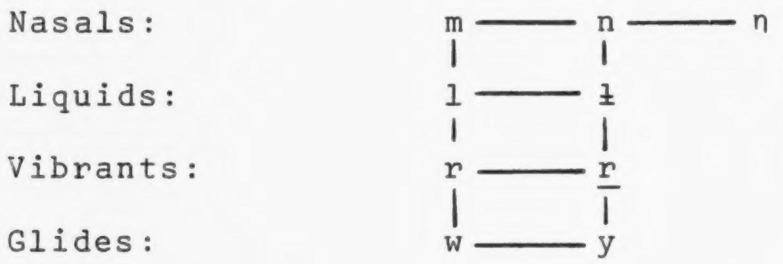
[h] voiceless glottal fricative

49. /haŋ/ [haŋ] 'courtyard'

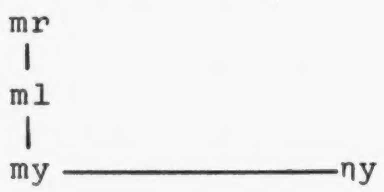
B. Sonants in Thakali

1. Contrast

Thakali may be described as having the following system of sonants. The following chart is given in terms of the symbols of the phonemic transcription. The orthography used for text differs from the phonemic transcription in that /ŋ/ = "ng" /ł/ = "L" and /r̲/ = "R".



This system of segments entails the following system of syllable-initial clusters in which sonants occur:



Evidence for contrast in the system of continuant consonants may be found in the following examples:

"moh"	$/mo^h/$	'cloud'
"'noh"	$/'no^h/$	'garlic'
"ngoh"	$/ŋo^h/$	'forehead'
"maah"	$/ma^h/$	'son-in-law'
"naah"	$/na^h/$	'pus'
"'ngaah"	$/'ŋa^h/$	'five'
"la"	/lɔ/	'month'
"La"	/łɔ/	'god, idol'

"rewa"	/rewɔ/	'to get up'
"Rewa"	/r̲ewɔ/	'to grate'
"waah"	/wa^h/	'so'
"yaah"	/ya^h/	'yak bull'

2. Variation

Variation from the phonetic norm has been noted for only two sonants. The velar nasal, /ŋ/ has a fronted variant which occurs before /i, e, y, i^h/ and e^h/ and a variant with labial release which occurs word-initial before /o/ and /o^h/. The alveodental vibrant has a trilled variant that occurs in geminate /r/-clusters and utterance initially. Utterance finally it is in free variation with the flapped variant.

/m/ [m] voiced bilabial nasal

/miku/ [mĭk̤u/mĭgu] 'smoke'

/n/ [n] voiced alveodental nasal

/'nɔkyu/ [nɔ̆k̯̤yu] 'dog'

/ŋ/ [ŋ] voiced velar nasal

/'ŋa^h/ [ŋă$^{\hat{h}}$] 'five'

[ŋ̯] voiced front-velar nasal

/ŋye^h/ [ŋ̯ye$^{\hat{h}}$] 'milk'

[ŋ^w] voiced velar nasal with labial release

/ŋo^h/ [ŋ^{w}ŏ$^{\hat{h}}$] 'forehead'

/l/ [l] voiced alveodental lateral

/la^{h}ṭu/ [la$^{\hat{h}}$ṭu] 'leftovers'

/ƚ/ [ƚ] voiceless alveodental lateral

/ƚɔpcyo/ [ƚɔpt̯šyo] 'let's learn'

/r/ [ř] voiced flapped alveodental vibrant

/'kɔru/ [kɔřu] 'buckwheat'

/'pra^h/ [přa$^{\hat{h}}$] 'flour'

[r̂] voiced trilled alveodental vibrant

/pɔ^{h}rri/	[pɔ$^{\hat{h}}$r̂·i]	'in the garden'
/resaŋ/	[r̂esaŋ]	'nearby'
/sɔr/	[sɔr̂]	'star'

/r̲/ [r̲] voiceless semitrilled alveodental fricative vibrant

/r̲uŋpɔ/	[r̲uŋbɔ]	'thick'

/w/ [w] voiced bilabial glide

/ṭawɔ/	[ṭawɔ]	'to weep'

/y/ [y] voiced palatal glide

/'ya^{h}/	[ya$^{\hat{h}}$]	'male yak'

C. Distribution of Consonants

All consonants occur alone in syllable-initial position. Subsets of the consonants are selected by other positions. The relevant environments may be described as follows:

a. Syllable-initial before a vowel

b. First member of a syllable-initial CC-cluster

c. Second member of a syllable-initial CC-cluster

d. Syllable-final.

The following chart summarizes consonantal distribution in terms of these environments.

	a	b	c	d
/p^{h}/	1	2	-	-
/t^{h}/	3	-	-	-
/ṭ^{h}/	4	-	-	-
/c^{h}/	5	6	-	-
/k^{h}/	7	8	-	-

/p/	a	b	c	d
/p/	9	10	-	11
/t/	12	13	-	14
/ṭ/	15	-	-	16
/c/	17	18	-	-
/k/	19	20	-	21
/s/	22	23	-	24
/h/	25	-	-	-
/m/	26	27	-	28
/n/	29	-	-	30
/ŋ/	31	32	-	33
/l/	34	-	35	36
/ƚ/	37	-	-	-
/r/	38	-	39	40
/r̲/	41	-	-	-
/w/	42	-	43	44
/y/	45	-	46	47

The numbers in the cells above refer to the following examples; for an account of the syllable-initial CC-clusters that occur, see section (A) above 'Obstruants in Thakali'. One odd kind of example has been omitted from that account.

"phryaawa"	/p^{h}ryawɔ/	'this'
"plyaawa"	/plyawɔ/	'flat'

For the latter a preferred alternate is

"plewa"	/plewɔ/	'flat'

The preceding are the only syllable-initial CCC-clusters found to date.

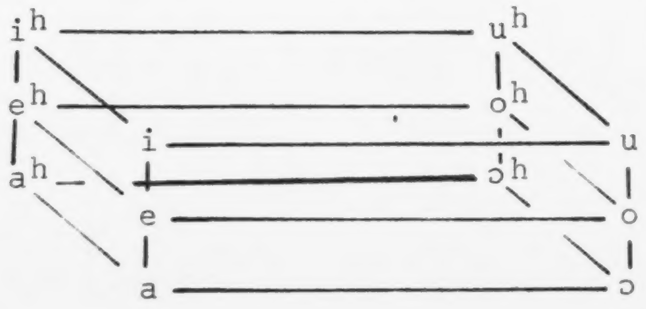
1.	"phaalo"	/pʰalo/	'festival'
2.	"phran"	/pʰrɔn/	'to unfasten'
3.	"thaa"	/tʰa/	'always'
4.	"Tha"	/ṭʰɔ/	'buzzard'
5.	"cho"	/cʰo/	'lake'
6.	"chyaarwa"	/cʰarwɔ/	'sharp'
7.	"khoro"	/kʰoro/	'upwards'
8.	"khyaawa"	/kʰyawɔ/	'to throw away'
9.	"pi"	/pi/	'leaves'
10.	"pro"	/pro/	'snack'
11.	"Lap"	/ƚɔp/	'hot'
12.	"tom"	/tom/	'bear'
13.	"truhma"	/truʰmɔ/	'next year'
14.	"cat cat"	/cɔt cɔt/	'frying noise'
15.	"Tihm"	/ṭiʰm/	'wall'
16.	"caTTi"	/cɔṭṭi/	'eleven'
17.	"cipi"	/cipi/	'a little'
18.	"cyah"	/cyɔʰ/	'tea'
19.	"kum"	/kum/	'urine'
20.	"kwaahri"	/kwaʰri/	'up there'
21.	"tohkci"	/toʰkci/	'arrived'
22.	"sici"	/sici/	'died'
23.	"sya"	/syɔ/	'meat'
24.	"is"	/is/	'exclamation of anger'
25.	"hak"	/hɔk/	'condition'

26. "min"	/min/	'name'
27. "'mlohwa"	/'mloʰwɔ/	'to pierce'
28. "mram"	/mrɔm/	'wooden chest'
29. "naah"	/naʰ/	'pus'
30. "pen"	/pen/	'small frog'
31. "nga"	/ŋɔ/	'I'
32. "ngyewa"	/ŋyewɔ/	'to laugh'
33. "phyong"	/pʰyoŋ/	'to jump'
34. "'lawa"	/'lɔwɔ/	'to do'
35. "'plih"	/'pliʰ/	'four'
36. "kyalwa"	/kyɔlwɔ/	'to swim'
37. "La"	/ɬɔ/	'god, idol'
38. "ru"	/ru/	'horn'
39. "phran"	/pʰrɔn/	'to unfasten'
40. "tar"	/tɔr/	'white'
41. "Rup"	/r̲up/	'thread'
42. "'wih"	/'wiʰ/	'leather bag'
43. "kwaahri"	/kwaʰri/	'up there'
44. "'khaw"	/'kʰɔw/	'come!'
45. "yewa"	/yewɔ/	'to return'
46. "chyo"	/cʰyo/	'direction'
47. "say"	/sɔy/	'price'

D. Vowels in Thakali

1. Contrast

Thakali may be described as having the following system of contrasting vowels:



The segments used in the diagram above are those of the phonemic transcription. The text orthography differs from the phonemic transcription in that /ɔ/ = "a", /a/ = "aa" and breathiness is written on the line /eʰ/ = "eh". There are no vowel clusters within the syllable.

Evidence for contrast in the system of vowels may be found in examples like the following:

"tiwa"	/tiwɔ/	'to spread'
"tihwa"	/tiʰwɔ/	'to stammer'
"tewa"	/tewɔ/	'to fall'
"tehwa"	/teʰwɔ/	'to drive away'
"tuhwa"	/tuʰwɔ/	'sorrow'
"towa"	/towɔ/	'to need'
"tohwa"	/toʰwɔ/	'to meet'
"kawa"	/kɔwɔ/	'thick'
"kahwa"	/kɔʰwɔ/	'to enjoy'
"naa"	/na/	'take!'
"naah"	/naʰ/	'pus'
"na"	/nɔ/	'nose'
"nah"	/nɔʰ/	'ear'
"ra"	/rɔ/	'goat'
"'rah"	/'rɔʰ/	'knows'

"ru"	/ru/	'horn'
"ruh"	/ru^h/	'stirs'
"rewa"	/rewɔ/	'to get up'
"rehwa"	/re^{h}wɔ/	'to grate'
"ro"	/ro/	'reported speech'
"roh"	/ro^h/	'friend'

"sawa"	/sɔwɔ/	'to complete'
"sahwa"	/sɔ^{h}wɔ/	'good'
"siwa"	/siwɔ/	'to die'
"sihwa"	/si^{h}wɔ/	'to spend'
"'suwa"	/'suwɔ/	'dense'
"'sowa"	/'sowɔ/	'hot'
"sohwa"	/so^{h}wɔ/	'to build'

2. Variation

Four major sets of environments have been identified as conditioning variation in vowels. For the present discussion we ignore the effect of intonation on length.

a. Nasalization: Nasalized variants occur following nasal consonants.

b. Fronting: Fronted variants occur following /y/ in non-word-final syllables and in closed final syllables where the syllable-final consonant is not /ŋ/.

c. Raising: Raised variants occur in syllables closed by /w/.

d. Word/stress group initially

1. Rounded vowels: Prelabialized variants

2. Breathy vowels: Preaspirated variant

3. Unrounded clear vowels: Preglottalized variant

The numbers in the cells below refer to the examples that follow.

		"norm"	a	b	c	d
"i"	/i/	1.[i]	2.[ĩ]			3.[ʔi]
"ih"	/i^{h}/	4.[i$^{\hat{h}}$]	5.[ĩ^{h}]			6.[^{h}i$^{\hat{h}}$]
"e"	/e/	7.[e]	8.[ẽ]			9.[ʔe]
"eh"	/e^{h}/	10.[e$^{\hat{h}}$]	11.[ẽ$^{\hat{h}}$]			12.[^{h}e$^{\hat{h}}$]
"aa"	/a/	13.[a]	14.[ã]	15.[æ$^{\hat{h}}$]		16.[ʔa]
"aah"	/a^{h}/	17.[a$^{\hat{h}}$]	18.[ã$^{\hat{h}}$]	19.[æ]		20.[^{h}a$^{\hat{h}}$]
"u"	/u/	21.[u]	22.[ũ]	23.[ŭ]		24.[^{w}u]
"uh"	/u^{h}/	25.[u$^{\hat{h}}$]	26.[ũ$^{\hat{h}}$]	27.[ü$^{\hat{h}}$]		28.[^{wh}u$^{\hat{h}}$]
"o"	/o/	29.[o]	30.[õ]	31.[ö]		32.[^{w}o]
"oh"	/o$^{\hat{h}}$/	33.[o$^{\hat{h}}$]	34.[õ$^{\hat{h}}$]	35.[ö^{h}]		36.[^{wh}o$^{\hat{h}}$]
"a"	/ɔ/	37.[ɔ]	38.[ɔ̃]	39.[ɑ]	40.[ɔ^]	
"ah"	/ɔ^{h}/	41.[ɔ̃$^{\hat{h}}$]	42.[ɔ$^{\hat{h}}$]	43. [ɑ$^{\hat{h}}$]	44.[ɔ$^{\hat{h}}$^]	

The environments listed above obviously intersect. The resultant matrix multiplication should be obvious to the reader and will not be given here.

1. [i] high close front unrounded vocoid

/k^{h}iwɔ/ [k̭^{h}iwɔ] 'to bind'

2. [ĩ] nasalized

/ɳi/ [ɳ̭ĩ] 'we'

3. [?i] preglottalized

/is/ [ʔis] 'exclamation of anger'

4. [i$^{\hat{h}}$] breathy

/ti^{h}ɳi/ [ṱi$^{\hat{h}}$ɳi] 'sun'

5. [ĩ^{h}] breathy nasal

/'ɳi^{h}/ [ɳ̭ĩ^{h}] 'two'

6.[ʰiʱ] preaspirated breathy

/iʰmu/ [ʰiʱmu] 'is'

7. [e] mid close front unrounded vocoid

/kʰewɔ/ [k̭ʰewɔ] 'to patch'

8. [ẽ] nasalized

/me/ [mẽ] 'fire'

9. [ˀe] preglottalized

/e/ [ˀe] 'exclamation: look here!'

10. [eʱ] breathy

/a'keʰwɔ/ [ˀak̭eʱwɔ/ˀageʱwɔ] '(I) don't cut'

11. [ẽʱ] breathy nasal

/meʰnto/ [mẽʱndo] 'flower'

12.[ʰeʱ] preaspirated breathy

/eʰ'lɔwɔ/ [ʰeʱlɔwɔ] 'to dress up'

13. [a] low open front unrounded vocoid

/kʰa/ [kʰa] 'neck'

14. [ã] nasalized

/ma/ [mã] 'down'

15. [æ] fronted

/pʰyasi/ [pʰyæs̭̆i] 'shining'

16. [ˀa] preglottalized

/ale/ [ˀale] 'money'

17. [aʱ] breathy

/'praʰ/ [přaʱ] 'flour'

18. [aʱ] nasalized breathy

/maʰ/ [maʱ] 'son-in-law'

19. [æʱ̂] fronted breathy

/'pyaʰwɔ/ [pyæʱ̂wɔ] 'to stumble'

20.[ʰaʱ̂] preaspirated breathy

/'aʰy/ [ʰaʱ̂y] 'meat (in children's speech)'

21. [u] high close back rounded vocoid

/'kʰuyu/ [kʰuyu] 'old woman'

22. [ũ] nasalized

/mu/ [mũ] 'sky'

23. [ü] fronted

/myur/ [myür̆] 'plenty'

24. [ʷu] prelabialized

/ur/ [ʷur̆/ʷur̂] 'yellow'

25. [uʱ̂] breathy

/'ṭuʰɳ/ [ṭuʰɳ] 'tree'

26. [ũʱ̂] nasalized breathy

/'nuʰwɔ/ [nũʰwɔ] 'to sleep'

27. [üʱ̂] fronted breathy

/yuʰl/ [yüʱ̂l] 'village'

28.[ʷʰuʱ̂] prelabialized preaspirated breathy

/uʰp tʰaɳ/] [ʷʰuʱ̂p ṱʰaɳ] 'musty smell'

29. [ọ] mid close back rounded vocoid

/kʰoro/ [kʰor̆o] 'upwards'

30. [õ] nasalized

/mom/ [mõm] 'grandmother'

31. [ö] fronted

/'syopin/ [s̭̆yöp̤in] 'boy adored as god'

32. [ʷo] prelabialized

/olɔ/ [ʷolɔ] 'red'

33. [oʱ] breathy

/toʰkci/ [ṱoʱkṱši] 'arrived'

34. [õʱ] nasalized breathy

/moʰ/ [mõʱ] 'cloud'

35. [öʱ] fronted breathy

/cyoʰpin/ [ṱšyöʱpin] 'teapot'

36. [ʷʰoʱ] labialized preaspirated breathy

/'oʰte/ [ʷʰoʱṱ̤e] 'so much'

37. [ɔ] low lax open back rounded vocoid

/'kʰɔwɔ/ [ḳʰɔwɔ] 'to come'

38. [ɔ̃] nasalized

/nɔ/ [nɔ̃] 'nose'

39. [α] fronted

/syɔppɔ/ [š̭yαp·ɔ] 'to catch up'

40. [ɔ^] raised

/'kʰɔw/ [ḳʰɔ^w] 'come!'

41. [ɔʱ] breathy

/'prɔʰno/ [přɔʱnõ] 'wait!'

42. [ɔ̃ʱ] nasalized breathy

/mɔʰri/ [mɔ̃ʱři] 'beneath'

43. [αʱ] fronted breathy

/'kyɔʰmuk/ [k̭yαʱmuk] 'brown'

44. [ɔʱ^] raised breathy

/'kɔʰw/ [ḳɔʱ^w] 'tweezers'

3. Distribution

No vowel clusters are found within the syllable. Breathy vowels are restricted in their distribution in that they do not occur following aspirated stops /p^h, t^h, c^h, $ṭ^h$, k^h/ or after the voiceless sonants /r̲, ł, h/. The low back vowels /ɔ, $ɔ^h$/ do not occur in syllables that end in /ŋ/.

CHEPANG SEGMENTAL SYNOPSIS

Ross C. Caughley

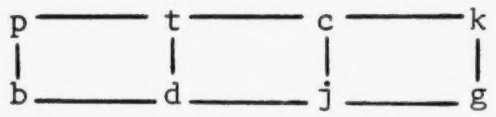
A. Obstruants in Chepang

1. Contrast

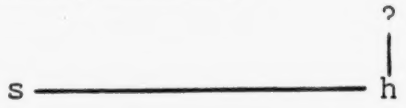
Voicing and aspiration are two of the more basic oppositions that run throughout the consonantal system of Chepang. Aspiration is interpreted as a clustering structure for stops.

Two classes of obstruants may be identified (I) those that cluster with aspiration and participate in the voiced voiceless opposition and (II) those that do neither: Two of the latter type (/h/ and /ʔ/) may very well not be obstruants.

(I)

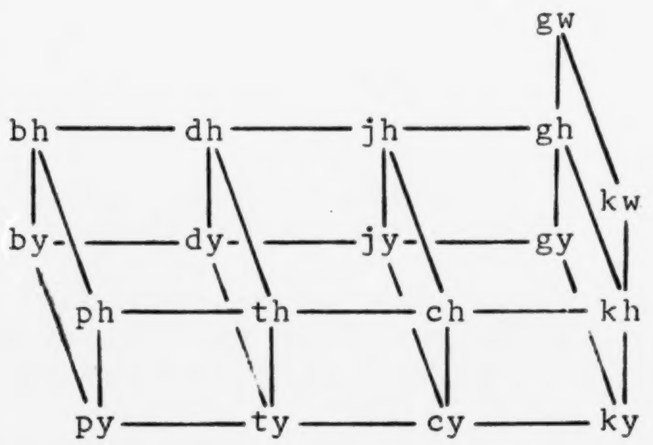


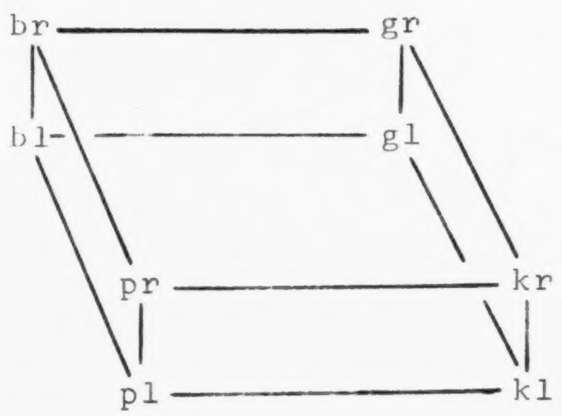
(II)



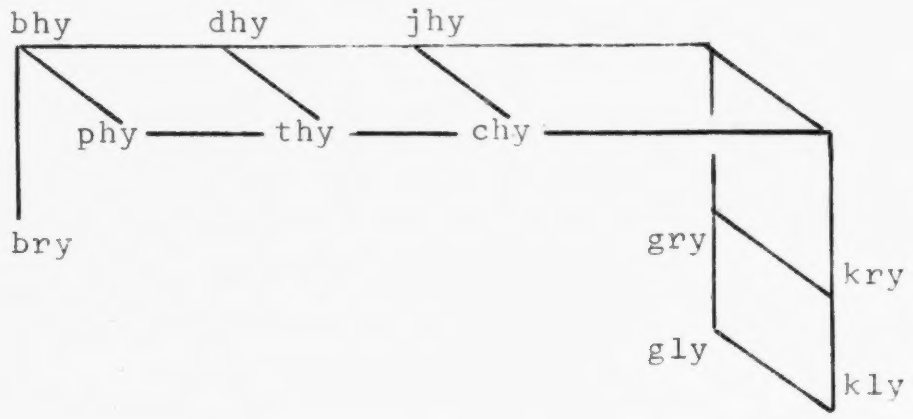
(For the segments above, the text orthography and the phonemic transcription are identical except that /ʔ/ = "?".) Consonants cluster to a considerable degree both initially and finally within the syllable. Syllable initial clusters in which stops occur are given below:

Syllable initial CC-clusters:




br
gr
bl-
gl
pr
kr
pl
kl

Syllable initial CCC-clusters:


bhy
dhy
jhy
phy
thy
chy
bry
gry
kry
gly
kly

There are two syllable-initial clusters in which non-stop obstruants occur:

sr ——— sy

Syllable-finally there is one cluster in which a stop occurs:

yk

Syllable-final clusters in which glottal stop occurs will be considered below in the section on sonants.

Evidence for constrast among obstruant phonemes is to be found in examples such as the following: (/-na/ is suffix for non-first person singular indefinite tense).

"paas-naa"	/pas-na/*	'carry on the shoulder'
"baas-naa"	/bas-na/	'make hem'

"taas-naa"	/tas-na/	'pull out hand'
"daas-naa"	/das-na/	'block hole'
"caas-naa"	/cas-na/	'make wasp nest'
"kaas-naa"	/kas-na/	'strike blow'
"gaas-naa"	/gas-na/	'make plot in field'
"paa-naa"	/pa-na/	'have father'
"baa-naa"	/ba-na/	'low of cattle'
"taa-naa"	/ta-na/	'get rid of'
"daa-naa"	/da-na/	'obtain'
"caa-naa"	/ca-na/	'have sores'
"saa-naa"	/sa-na/	'search for lice'
"haa-naa"	/ha-na/	'cook with lid on'
"kaa-naa"	/ka-na/	'put in'
"?aa-naa"	/?a-na/	'be going'
"cer"	/cer/	'torch stick'
"jer"	/jer/	'kindling sticks'
"chaak-naa"	/chak-na/	'prepare tobacco'
"jhaak-naa"	/jhak-na/	'be pleased'

2. Variation

Three environments other than /?/ and /h/ have been identified which condition variations from the norm in obstruants. These environments are as follows:

Empty cells approximate the norm, stricken cells have no representative. It should be mentioned here, however, that /s/ fronts before /i, e/ but not after, thus forming an exception.

a. Fronting: adjacent to front vocoids /i, e/

b. Backing: adjacent to back vocoids /u, o/

c. Unreleased: utterance final

	"norm"	a	b	c
/p/	1. [p]			2. [p˺]
/t/	3. [t]	4. [ṱ]		5. [t˺]
/c/	6. [tš]	7. [ṱṣ̌]	8. [ṱs]	
/k/	9. [k]	10. [k̭]	11. [ḳ]	12. [k˺]
/b/	13. [b]			-
/d/	14. [d]	15. [ḓ]		-
/j/	16. [dž]	17. [ḓž]	18. [ḓ·ž]	-
/g/	19. [g]	20. [g̭]	21. [g]	-
/s/	22. [s]	23. [š]		

The numbers in the cells above refer to the examples that follow.

1. [p] voiceless bilabial stop

/pah/ [pah] 'bamboo pot'

2. [p˺] voiceless bilabial unreleased stop

/tip/ [ṱɪp˺] 'fish trap'

3. [t] voiceless post dental stop

/tom/ [tɔˇm] 'a knot'

/?ot.na/ [?ɔˇt.na] 'give birth'

4. [ṱ] voiceless dental stop

/tip/ [ṱɪp˺] 'fish trap'

/cit/ [ṱṣ̌ɪṱ.nəm] 'day before yesterday'

5. [t˺] voiceless post dental unreleased stop

/kət/	[kə^ṭ˺]	'residue'

6. [tš] voiceless apico post dental stop with a grooved laminal release

/cak/	[tšak˺]	'hard'

7. [ṱṣ̌] voiceless dental stop with a grooved lamino-alveolar fricative release

/cit.nəm/	[ṱṣ̌ɩṱ.nəm]	'day before yesterday'

8. [tš̭] voiceless apico post dental stop with a slightly grooved apical fricative release

/cok/	[tš̭ɔˇḳ˺]	'root'

9. [k] voiceless velar stop

/kət/	[kə^t˺]	'residue'

10. [k̭] voiceless front-velar stop

/kil/	[k̭ɩl]	'hip joint'
/nik.na/	[ṋɩk̭.na]	'cold'

11. [ḳ] voiceless back velar stop

/kos/	[ḳɔˇs]	'sugar cane'
//rok.na/	[řɔˇḳ.na]	'spicy'

12. [k˺] voiceless unreleased velar stop

/tək/	[tə^k˺]	'hoe'

13. [b] voiced bilabial stop

/bas/	[ba^s]	'hem'

14. [d] voiced alveodental stop

/dalˀ/	[dalˀ]	'worm'

15. [ḓ] voiced dental stop

/dik/	[ḓɩk̭˺]	'a wasp'

16. [dž] voiced apico post dental stop with a grooved laminal release

/jəm/	[džə^m]	'a god'

17. [ḓž] voiced dental stop with a grooved lamino alveolar release

/jip/	[ḓžɩp˺]	'needle'

18. [dž͓] voiced apico post dental stop with a slightly grooved apical fricative release

/jos/	[dž͓̭ɔ^s]	'a knot'

19. [g] voiced velar stop

/gəl/	[gə^l]	'kidney'

20. [g̭] voiced front velar stop

/giŋˀ/	[g̭ɩŋ̭ˀ]	'upper back'

21. [g̣] voiced back velar stop

/guŋˀ/	[g̣ʊŋˀ]	'squirrel'

22. [s] voiceless alveolar fricative

/so /	[sɔ˘ŋ]	'blade end'
/lis/	[lɩs]	'boil'

23. [š] voiceless alveopalatal grooved fricative

/siŋˀ/	[šɩŋˀ]	'wood'

Note that a following /h/ has the same influence on an affricate as environment (a). The influence of a following /h/ on stops has not been determined.

/cho-na/	[ṱṣ̽hɔ^-na]	'shade eyes'

Variation in Glottals /h/ and /ˀ/

Two kinds of environments have been identified as responsible for variation in /h/:

a. Lenis voicing: following voiced stops

/dha-na/	[dĥa-na]	'heat'
/Meˀ/	[Mɛˆˀ]	'fire'
/Nap/	[Naˆp]	'bed place'
/Ŋa-na/	[Ŋa-na]	'be in front'
/Luɳ/	[Luˇɳ]	'heart'

b. Assimilation: adjacent to a sonant

/Rus/	[Rus]	'bone'
/Woyɳ/	[Woyɳ]	'waist'
/Yuɳˀ/	[Yuɳˀ]	'flea'

Variation in the glottal stop, /?/ is largely free. The variants of /?/ range over a continuum which includes the following four variants.

1. [ˀ] Glottal stop accompanied by sharp decrescendo and a sharp fall in pitch.

2. [?̤] Lenis glottal stop with sharp decrescendo and fall in pitch.

3. [·\] Lengthening of the preceding segment, sharp decrescendo and fall in pitch.

4. [?̤̃] Weak laryngealization of the 'glottal interval'.

The contrast between syllables closed by a glottal (type A syllables) and open syllables (type B syllables) is always maintained under stress because type B syllables never have sharp fall in pitch, sharp decrescendo, or laryngealization under stress. In unstressed position the contrast may be lost at times.

There is a considerable amount of free fluctuation within the range of glottal stop variants given above, though certain environments seem to increase the probability that one or another of the variants will occur. Thus variant (3) is more frequent where the following syllable is of type A. Variant (1) is more frequent where the following syllable begins with a voiceless consonant and is of type B. Before a type B syllable with an initial voiced consonant, any variant is likely to occur.

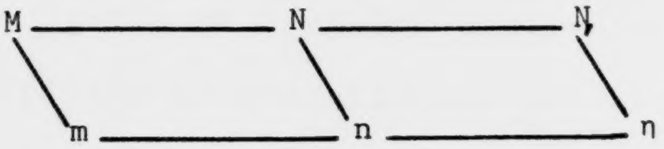
/'laʔ/	['laʔ / 'laʔ̤ / 'la·⌒ / 'laʔ̤̃]	'arrows'
/'la/	['la]	'rope'

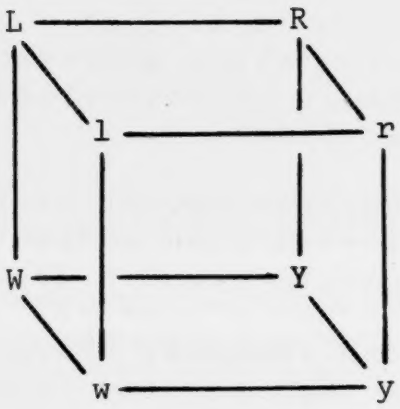
B. Sonants in Chepang

1. Contrast

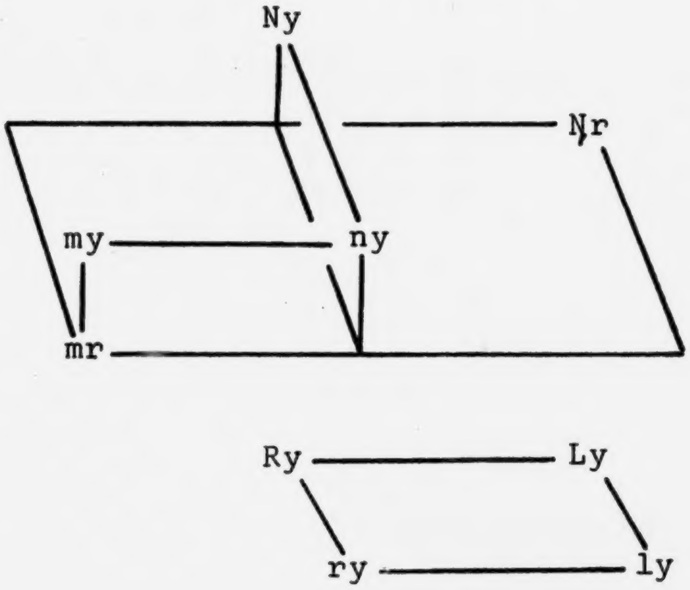
Sonants in Chepang are open to two kinds of interpretation. One may view them as participating in the basic voiced-voiceless opposition or one may view them as clustering with /h/. If one considers the parallelism between /ʔ/ and /h/ in syllable final position one may find reason to adopt the cluster solution. If one wishes to emphasize the remarkable symmetry between voiced and voiceless segments throughout the system one may wish to adopt the unit phoneme solution. Since we wish to keep both options open at the moment, we have chosen to use the cluster solution for text orthography and the unit solution for phonemic transcription.

The following is the system of sonants on the unit solution (phonemic transcription):

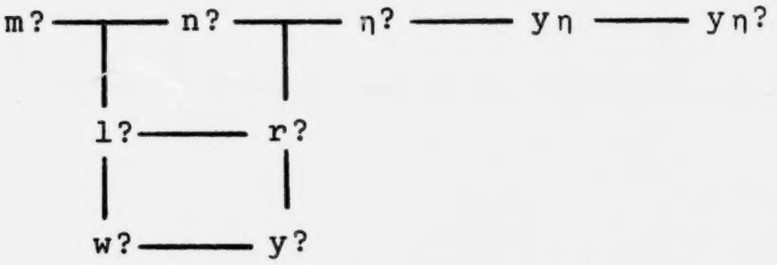




Initial Clusters:

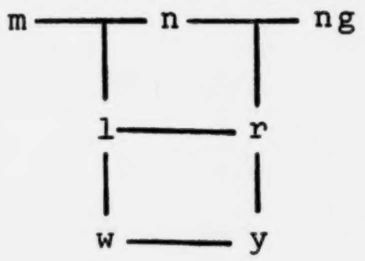

Ny
N̥r
my
ny
mr
Ry
Ly
ry
ly

Final Clusters:

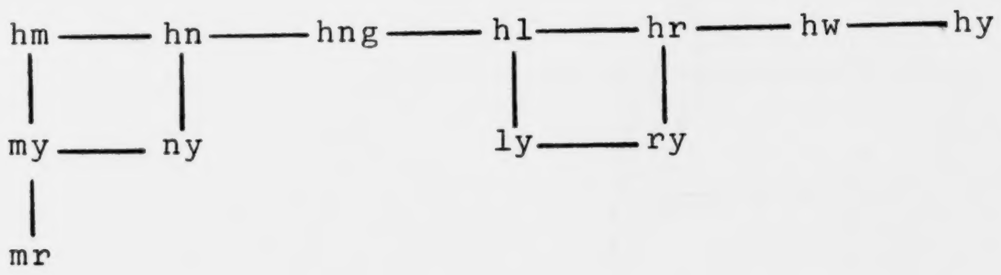

m?
n?
η?
yη
yη?
l?
r?
w?
y?

The following is the system of sonants on the cluster solution (text orthography):

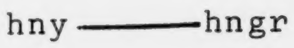
segments:



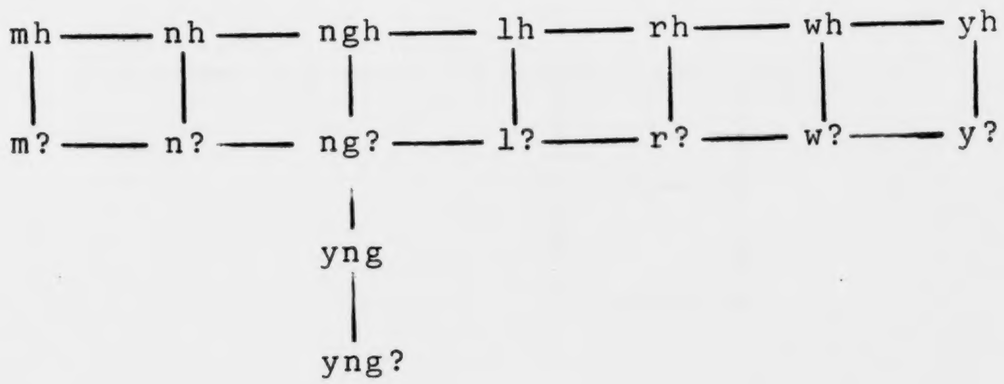
Initial Clusters: CC-


hm
hn
hng
hl
hr
hw
hy
my
ny
ly
ry
mr

Initial Clusters: CCC-



Final Clusters:


mh
nh
ngh
lh
rh
wh
yh
m?
n?
ng?
l?
r?
w?
y?
yng
yng?

Contrast in the system of sonants can be found in examples such as the following:

"raa-naa"	/ra-na/	'winnow'
"laa-naa"	/la-na/	'take away'
"maa-naa"	/ma-na/	'be a mother'
"naa-naa"	/na-na/	'be many'
"ngaa-naa"	/ŋa-na/	'boast'
"yaa-naa"	/ya-na/	'squeeze'
"waa-naa"	/wa-na/	'to cut'

"rok-naa"	/rok-na/	'be spicy'
"lok-naa"	/lok-na/	'be far'
"hrok-naa"	/Rok-na/	'snore'
"hlok-naa"	/Lok-na/	'send'

2. Variation

Relatively little variation has been noted in Chepang sonants. /r/ has a trilled variant [r̂] syllable final but normally a flapped variant [r̆] elsewhere.

/harʔ/	[har̂ʔ]	'sputum'
/gruʔ/	[gr̆uʔ]	'dough'

/n/ and /ŋ/ are fronted adjacent to /i/

/nik-na/	[ṋɩk-na]	'be cold'
/ŋi/	[ŋ̭i^]	'we'
/winʔ/	[wɩn̽ʔ]	'bat'
/siŋʔ/	[šɩŋ̽ʔ]	'wood'
/nap/	[na^p˺]	'bamboo top'
/pun/	[pʊn]	'skin'
/ŋən/	[ŋə^n]	'gumminess'
/baŋ/	[ba^ŋ]	'stone'

/u/ has bilabial friction before front vocoids

/win/	[wɩn]	'bat'
/wer/	[wɛr]	'hail'
/was/	[wa^s]	'bee'
/lawʔ/	[lawʔ]	'mat'

/kwər?/	[kwər?]	'owl'

C. Distribution of Consonants in Chepang

Consonantal distribution within the syllable in Chepang may be summarized in terms of the following charts.

Initial CC-clusters with obstruants

First Member	Second Member				
	h	y	r	l	w
p	1	10	18	22	5
t	2	11	--	--	--
c	3	12	--	--	--
k	4	13	19	23	--
b	6	14	20	24	--
d	7	15	--	--	--
j	8	16	--	--	--
g	9	17	21	25	5a
s	--	27	26	--	--

Initial CCC-clusters with obstruants

First Member	Second Member		
	hy	ry	ly
p	28	--	--
t	29	--	--
c	30	--	--
k	--	34	37
b	31	35	--
d	32	--	--

	hy	ry	ly
j	33	--	--
g	--	36	38

Initial CC-clusters voiced sonants

First Member	Second Member	
	y	r
m	40	42
n	41	--
ŋ	--	--
l	43	--
r	44	--

Initial CC and CCC-clusters with voiceless (h-cluster) sonants

First Member	Second Member								
	m	n	ng	l	r	w	y	ny	ngr
h	45	46	47	48	49	50	51	52	53

Final CC-clusters

First Member	Second Member			
	h	?	k	ŋ
m	54	55	--	--
n	56	57	--	--
ŋ	58	59	--	--
l	61	62	--	--
r	63	64	--	--

	h	?	k	ŋ
w	65	66	--	--
y	67	68	39	60

Final CCC-cluster

69 yŋ?

Numbers in the cells above refer to the following examples:

1.	"phop"	/phop/	'bubble
2.	"thaa-naa"	/tha-na/	'sprout'
3.	"chaak-naa"	/chak-na/	'prepare tobacco'
4.	"khaa-naa"	/kha-na/	'be in'
5.	"kwaa:	/kwa/	'close friend'
5a.	"gwar"	/gwər/	'frame of a fishnet'
6.	"bhop"	/bhop/	'blister'
7.	"dhaa-naa"	/dha-na/	'be attacked by a spirit'
8.	"jhaak-naa"	/jhak-na/	'be pleased'
9.	"ghaa-naa"	/gha-na/	'stride'
10.	"pyaak"	/pyak/	'pig'
11.	"tyaap"	/tyap/	'gullet'
12.	"cyok-naa"	/cyok-na/	'get up'
13.	"kyaan?"	/kyanʔ/	'curry'
14.	"byaah-naa"	/byah-na/	'wander'
15.	"dyur"	/dyur/	'saliva'
16.	"jyok-naa"	/jyok-na/	'jump over'
17.	"gyaap:	/gyap/	'needle'
18.	"preng?"	/prengʔ/	'a type of ant'

19.	"kraat"	/krat/	'louse'
20.	"bra-naa"	/brə-na/	'mistake'
21.	"grom-naa"	/grom-na/	'hug'
22.	"ple-naa"	/ple-na/	'cut open'
23.	"klaa?-naa"	/kla?-na/	'catch'
24.	"bling-naa"	/bliŋ-na/	'fill'
25.	"glih"	/glih/	'a root'
26.	"srup"	/srup/	'loop'
27.	"syaa?"	/sya?/	'cow'

The following are examples of syllable initial CCC-clusters:

28.	"phyaas-naa"	/phyas-na/	'brush clothes'
29.	"thyor"	/thyor/	'a plant'
30.	"chyaak-naa"	/chyak-na/	'peel'
31.	"bhyaas-naa"	/bhyas-na/	'escape from trap'
32.	"chyon.kor?"	/dhyon.kor/	'a rod'
33.	"jhyaa-naa"	/jhya-na/	'beat'
34.	"kryong?"	/kryoŋ?/	'knee'
35.	"bryok"	/bryok/	'fried maize'
36.	"gryaang"	/gryaŋ/	'big basket'
37.	"klyut-naa"	/klyut-na/	'graze one's skin'
38.	"glyungh-naa"	/glyuN-na/	'descend'

The following is an example of the syllable final cluster in which a stop occurs:

39.	"srayk"	**/srəyk/**	'louse'

The following are examples of all the syllable-initial clusters so far observed in which sonants occur:

CC-clusters:

40.	"myaang"	/myaŋ/	'hair'
41.	"nyaas-naa"	/nyas-na/	'rest'
42.	"mroyk-naa"	/mroyk-na/	'twist and break'
43.	"lyungh-naa"	/lyuŊ-na/	'watch
44.	"ryaan?"	/ryanˀ/	'a wasp'
45.	"hme?"	/Me?/	'fire'
46.	"hnaap"	/Nap/	'sleeping place'
47.	"hngaa-naa"	/Na-na/	'be in front'
48.	"hlok-naa"	/Lok-na/	'send'
49.	"hrus"	/Rus/	'bone'
50.	"hwat-naa"	/Wət-na/	'ask'
51.	"hyung?"	/Yuŋ?/	'flea'

CCC-clusters:

52.	"hnyak-naa"	/Ny k-na/	'to be saw-toothed' (or a ridge)
53.	"hngrok-naa"	/Nrok-na/	'snore'

The following are examples of all the syllable-final clusters so far observed:

54.	"saamh-naa"	/saM-na/	'feel'
55.	"nyaam?"	/nyamˀ/	'cricket insect'
56.	"manh-naa"	/məN-naa/	'be ready'
57.	"kyaan?"	/kyan?/	'curry'

58.	"saangh-naa"	/saŊ-na/	'move'
59.	"laang?"	/laŋ?/	'net'
60.	"sayng-naa"	/sayŋ-naa/	'emit smell'
61.	"jelh"	/jeL/	'forehead'
62.	"daal?"	/dal?/	'water worm'
63.	"horh"	/hoR/	'genealogy'
64.	"thor""	/thor?/	'stalk of maize'
65.	"kaawh-naa"	/kaW-na/	'pluck'
66.	"raaw?-naa?	/raw-na/	'spin'
67.	"paayh-naa"	/paY-na/	'return'
68.	"way?"	/wəy?/	'blood'
69.	"moyng?"	/moyŋ?/	'name'

All consonants occur alone syllable initially before a vowel and have been illustrated in this position in the sections on contrast above. In syllable final position the following consonants have been observed to occur alone following a vowel, (where "alone" is defined on cluster solution):

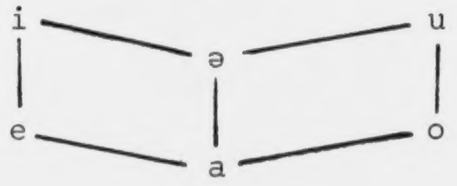
/p/	"bop"	/bop/	'snail'
/t/	"klyut-naa"	/klyut-na/	'graze one's skin'
/k/	"bryok"	/bryok/	'fried maize'
/s/	"mos"	/mos/	'ghost'
/m/	"kimlam"	/kɪmləm/	'houses'
/n/	"pan"	/pən/	'bedbug'
/ŋ/	"gryaang"	/gryaŋ/	'big basket'
/r/	"wer"	/wer/	'hail'
/l/	"kil"	/kil/	'hip joint'

/w/	"kaaw"	/kaw/	'fish scale'
/y/	"maay-naa"	/may-na/	'be small'
/h/	"teh"	/teh/	'last year'
/?/	"cu?"	/cuˀ/	'thorn'

D. Vowels in Chepang

1. Contrast

Chepang may be described as having the following system of contrasting vowels:



The vowels given above are those of the phonemic transcription. Text orthography differes from the phonemic transcription in that /ə/ = "a" and /a/ = "aa". Evidence for contrast within the system of vowels is found in examples like the following:

"?ik-naa"	/ˀik-na/	'count'
"?ak-naa"	/ˀək-na/	'lift'
"?ek-naa"	/ˀek-na/	'vomit'
"?aak-naa"	/ˀak-na/	'split'
"?ok-naa"	/ˀok-na/	'reject'
"?is-naa"	/ˀis-na/	'insert'
"?us-naa"	/ˀus-na/	'whistle'
"?es-naa"	/ˀes-na/	'weave'
"?aas-naa"	/ˀas-na/	'be happy'
"hras-naa"	/Rəs-na/	'choke'

"hrus-naa"	/Rus-na/	'boney, thin'
"hres-naa"	/Res-na/	'scattered'
"hraas-naa"	/Ras-na/	'spread'
"hros-naa"	/Ros-na/	'much rubbish'

2. Variation

Three environments have been found which condition variation from the norm in vowels:

a. Tense: In open syllables vowels are tense. Tense is defined as a higher tongue position for vowels except the central vowels /ə/ and /a/. Tense for these vowels involves a lower tongue position.

b. Lax: In syllables closed by /?/ and /h/ vowels approximate their norms, except for /i/ which has a tense variant in this environment. In syllables closed by other consonants vowels have a lax variant.

c. Fronting (and unrounding): All vowels except /i, e/ and /ə/ are fronted, and, if rounded, somewhat unrounded, following /y/.

The following chart summarizes the major variants of vowels. The numbers in the cells refer to the examples that follow:

	"norm"	a	b	c
/i/	1.[i]	2.[i^]	3.[ɩ]	-
/e/	4.[e]	5.[e^]	6.[ɛˇ]	-
/ə/	7.[ə]	8.[əˇ]	9.[ə^]	-
/a/	10.[a]	11.[aˇ]	12.[a^]	13.[æ]
/o/	14.[ɔ]	15.[ɔ^]	16.[ɔˇ]	17.[ɔ<]
/u/	18.[u]	19.[u^]	20.[ʋ]	21.[u<]

1. [i] high front unrounded vocoid

/ti?/	[ṱi?]	'water'

2. [i^] raised (tense)

/ki/ [k̭i^] 'a grass'

3. [ι] open (lax)

/tik/ [ṱιk̭] 'a frog'

4. [ɛ^] front mid unrounded vocoid

/teh/ [ṱɛ^h] 'last year'

5. [e] raised (tense)

/ke/ [ke] 'hook'

6. [ɛ] open (lax)

/mes/ [mɛs] 'before'

7. [ə] central mid unrounded vocoid

/bah/ [bəh] 'brother-in-law'

8. [əˇ] lowered (tense)

/ra/ [řəˇ] 'vine'

9. [ə^] raised (lax)

/tak/ [tə^k̭] 'hoe'

10. [a] central low unrounded vocoid

/pah/ [pah] 'bamboo pot'

11. [aˇ] lowered (tense)

/la/ [laˇ] 'rope'

12. [a^] raised (lax)

/bas/ [ba^s] 'hem of bag'

13. [æ] fronted

/pyak/ [pyæk] 'pig'

14. [ɔ] back mid rounded vocoid

/co?/ [t́š̭ɔ?] 'child'

15. [ɔ^] raised (tense)

/lo/ [lɔ^] 'leaf'

16. [ɔ˘] back low close (lax)

/bop/ [bɔ˘p] 'snail'

17. [ɔ<] fronted

/ryom?/ [řyɔ<m?] 'a red ant'

18. [u] back high rounded vocoid

/cu?/ [t́š̭u?] 'thorn'

19. [u^] raised (tense)

/su/ [su^] 'who'

20. [ʋ] open (lax)

/pun/ [pʋn] 'skin'

21. [u<] fronted

/tyun-na/ [ṱyu<n-na] 'short'

3. Distribution

Vowel clusters do not occur within the syllable. Within the syllable vowels occur freely with respect to all consonants and consonant clusters in syllable initial position except for /ŋ/, /y/ and /w/. These restrictions (which may, in the case of /ŋ/ actually be gaps in our data) are as follows:

a. Following /ŋ/, /e/ and /u/ have been observed.

b. Following syllable-initial /y/, /i/ and /e/ have not been observed.

c. Following post-consonantal /y/, /i/ has not been observed.

d. Following syllable-initial /w/, /u/ and /o/ have not been observed.

e. Following post-consonantal /w/, /u/ and /o/ have not been observed.

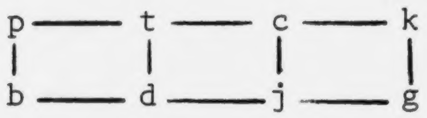
NEWARI SEGMENTAL SYNOPSIS

Austin Hale

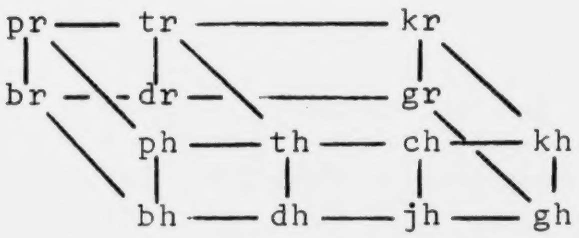
A. Stops in Newari

1. Contrast

Newari may be described as having the following system of contrasting stops: (Consonants are represented identically in both phonemic (/--/) and the text orthographic ("--") transcriptions. The diagram of contrasts represents both, hence the omission of quotes and slashes which will be used below, for citation forms.



Choosing this system of stops entails choosing the following system of syllable-initial clusters in which stops occur.



It should be noted that the "h" series is native to Newari, but that the "r" series is almost certainly borrowed. If known loan words were excluded from the analysis there would be no phoneme /r/. The phone [ř] would rather be interpreted as a word-medial and word-final variant of /d/. Native Newari words contain initial [d] but no initial [ř]. Medially and finally [ř] is the norm. In morpheme-initial word-medial position, however, [ř] and [d] have been observed to fluctuate freely. (For an explanation of the parenthesized abbreviations which follow the English glosses below see the list of abbreviations given in the appendices to the Newari texts elsewhere in this volume. For conventions for transcription of vowels see section **(D)** below.)

/du/	[ḍu]	'be' (FII)
/mədu/	[məṛ̌u/məḍu]	'not be' (FII)

Loans, however, introduce both word-initial [r̆] (usually [^{ə}r̆], accommodating somewhat to the native pattern though native speakers seem unaware of the initial [^{ə}] and they certainly do not view it as a full syllable) and an invariant [d] in medial and final positions within the word. For certain speakers word-initial "r" has a free variant in "l".

/ram/	[^{ə}r̆am] ∿ [lam]	'Ram' (Proper Name)
/bənduk/	[bənḍuk]	'rifle'
/sidhə-lə/	[sidhəḷə] ∿ [sir^{h}əḷə]	'finish' (PII)
/səbdə/	[səbdə]	'word'
/bərbad/	[bər̆bad]	'total loss'
/rachiəs/	[^{ə}rats^{h}ɛs] ∿ [lats^{h}ɛs]	'giant'

Evidence for contrast in the system of stops is found in examples like the following:

"py"	/pi/	'four' (Counting form)
"ty"	/ti/	'soup'
"cy"	/ci/	'salt'
"ky"	/ki/	'that' (Quotative)
"by"	/bi/	'make way!' (Impv)
"dy"	/di/	'be' (R)
"jy"	/ji/	'I'
"gyy"	/gii/	'rotten'
"py-y"	/pi-i/	'grow' (FII)
"by-y"	/bi-i/	'give' (FII)
"paw"	/pəu/	'roof'
"baw"	/bəu/	'father'
"thyy"	/thii/	'gem'
"dhyy"	/dhii/	'clod'

"ta:-la"	/ta-lə/	'hear' (PII)
"da:-la"	/da-lə/	'beat' (PII)
"pa:"	/pa/	'hatchet'
"ca:"	/ca/	'night'
"ja:"	/ja/	'cooked rice'
"cya:"	/cia/	'tea'
"jya:"	/jia/	'work'
"ka:"	/ka/	'thread'
"ga:"	/ga/	'shawl'
"kwn'"	/kũ/	'dense smoke'
"gwn'"	/gũ/	'forest'

The following are examples of clusters in which stops occur.

"phw"	/phu/	'able' (PII)
"bhw"	/bhu/	'plate'
"bhaw"	/bhəu/	'cat, daughter-in-law'
"swtha"	/suthə/	'morning'
"dhwn'"	/dhũ/	'tiger'
"chw"	/chu/	'what?'
"chwn'"	/chũ/	'mouse'
"jhyy"	/jhii/	'we' (Inclusive)
"khwn'"	/khũ/	'thief'
"ghaa"	/ghəə/	'pitcher'
"prythybyy"	/prithibii/	'earth'
"ja:tra:"	/jatra/	'festival'
"krypa:"	/kripa/	'favor'

2. Variation.

Five sets of environments have been identified as responsible for variation in stops. They are as follows, labeled according to the kind of variation induced. (For single slash read "in the environment".)

a. Fricativization: / /ə__hu/

b. Affrication: / / __u/

c. Backing: / / __u/ (and to a lesser extent: / / __ə/)

d. Fronting: / / __i/ (syllable initial--to a lesser extent also: / / __a/. Syllable final fronting occurs: / / i__/)

e. Grooving: / / __i/
/ / __u/ (Some grooving is possible in all environments.)

In the following chart, the horizontal axis lists the environments, the vertical axis, the segments and the cells contain the broad phonetic values. Where a cell is blank, the environment does not effect a variation from the norm of the environment does not effect a variation from the norm of sufficient degree and consistency to be impressionistically significant for the segment involved. Numbers in the cells refer to the examples below.

		a	b	c	d	e
"p" /p/	1.[p]	2.[ꝑ]*	3.[p^f]			
"t" /t/	4.[t]			5.[ṭ]	6.[ṱ]	
"c" /c/	7.[ts]					8.[tš]
"k" /k/	9.[k]			10.[ḳ]	11.[k̭]	
"b" /b/	12.[b]		13.[b^v]			
"d" /d/	14.[d]			15.[ḍ]	16.[ḓ]	
"j" /j/	17.[dz]					18.[dž]
"g" /g/	19.[g]			20.[g̣/ǥ̣/w]	21.[g̭]	

*Note that this is the realization of the cluster /ph/ in this environment. The same variant occurs word-finally in the word

"ta:ryph" /tariph/ 'praise'

In the following, each variant is given a brief articulatory description and is exemplified.

1. [p] voiceless bilabial stop

/pittə/ [pɩṱṱə] 'bile'

2. [ᵽ] voiceless bilabial fricative

/səphu/ [səᵽu] 'book'

3. [p^f] voiceless bilabial stop with labio-dental affrication

/pu/ [p^fu] 'page, seed'

4. [t] voiceless apico-alveolar stop. (Often occurs before /a/ and /ə/ though /a/ has some fronting and /ə/ some backing effect on a preceding /t/.)

/tha-na/ [t^hənə] 'here'

5. [ṭ] voiceless apico-domal stop

/tu/ [ṭu] 'sugar cane'

6. [t] voiceless apico-dental stop

/ti/ [t͓i] 'soup'

7. [ts] voiceless apico-alveolar affricate

/ca/ [tsa] 'soil'

(Some grooving is possible for /c/ in all environments.)

8. [tš] voiceless lamino-alveolar (grooved) affricate

/ci/ [tši] 'salt'

9. [k] voiceless dorso-velar stop

/kəpa/ [kəpa] 'forehead'

10. [ḳ] voiceless backed dorso-velar stop

/kuu/ [ḳu:] 'spade'

11. [k̭] voiceless fronted dorso-velar stop

/kii/ [k̭i:] 'insect'

12. [b] voiced bilabial stop

/baa/ [ba:] 'flood'

13. [b^{v}] voiced bilabial stop with labio-dental affrication

/bũ/ [b^{v}ũ] 'field'

14. [d] voiced apico-alveolar stop (Often occurs before /a/ and /ə/, though /a/ has some fronting and /ə/ some backing effect on a preceding /d/.)

/dən-ə/ [dənə] 'stand' (PII)

15. [ḍ] voiced apico-domal stop

/du/ [ḍu] 'be' (PII)

16. [ḓ] voiced apico-dental stop

/di/ [ḓi] 'be' (R)

17. [dz] voiced apico-alveolar affricate (Some grooving is possible for /j/ in all environments.)

/ja/ [dza] 'cooked rice'

18. [dž] voiced lamino-alveolar (grooved) affricate

/ji/ [dži] 'I'

19. [g] voiced dorso-velar stop

/gəra/ [gəřa] 'ass'

20. [g̣] voiced back-dorso-velar stop

/gu-ca/ [g̣utsa] 'marble'

In post-vocalic position there is an alternation between a slow, clear [g̣] and fast variants [g] and [w].

/chə-gu/ [tš^{h}ə-g̣u/tš^{h}ə-g̣u/tš^{h}ə-wu] 'one'

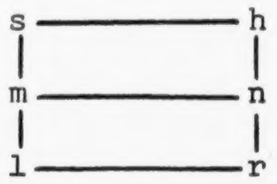
21. [g̭] voiced front dorso-velar stop

/gii/ [g̭i:] 'rotten'

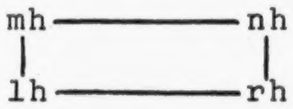
B. Continuant Consonants in Newari

1. Contrast

Newari may be described as having the following system of continuant consonants.



Choosing this system of continuants entails the following system of syllable-initial clusters in which continuants occur.



Evidence for contrast in the system of continuant consonants may be found in examples like the following.

"sy"	/si/	'louse'
"hy"	/hi/	'blood'
"my"	/mi/	'fire'
"ny"	/ni/	'two' (Counting form)
"sa:"	/sa/	'cow'
"ha:"	/ha/	'bee, root'
"na:"	/nə/	'take!' (Impv)
"maa:"	/maa/	'garland'
"la:"	/la/	'meat'
"ra:ja:"	/raja/ ∿ /la:ja/	'king'
"lyy"	/lii/	'brass'
"nyy"	/nii/	'twenty' (Counting form)
"ma:ry"	/mari/	'bread'

"laa-n,"	/lə̃ə̃/	'road' (A)
"raan,"	/rə̃ə̃/ ∿ /lə̃ə̃/	'color'

Regarding the contrastive status of "r", see the section on stops, (1) Contrast.

The following are examples of clusters in which continuant consonants occur.

"mhw"	/mhu/	'handful'
"nhw"	/nhu/	'day'
"lhaa:"	/lhaa/	'hand'
"taa-rhaan,-gw"	/təə-rhə̃ə̃-gu/	'big'

2. Variation

Six sets of environments have been identified which effect variation in continuant consonants. They are as follows, labeled according to the variation they induce.

a. Lenis / elision: / V__V (Inter-vocalically)

b. Voicing: / Voiced stop __

c. Backing: / / __u/

to a lesser extent also: / / __ə/

when syllable final also: / / ə__/

/ / u__/

d. Fronting: / / __i/

to a lesser extent also: / / __a/

when syllable final also: / /i__ /

/ /a__ /

e. Grooving: (Where /i/ is non-syllabic:) / / __i/

f. Velar Assimilation: / / __k/

The following chart plots environments on the horizontal axis against segment types on the vertical axis. Segment types with variants other than the norm have the phonetic values in the columns representing the environments in which these variants occur. Cells are left blank where interesting and consistent phonetic deviation from the norm has not been discovered. Numbers in the cells refer to examples below.

	"norm"	a	b	c	d	e	f
"s" /s/	22.[s]			23.[ṣ]		24.[š]	
"h" /h/	25.[h]	26.[h̤]	27.*[ɦ/ʰɦ]	28.[ḥ]	29.[h̭]		
"m" /m/	30.[m]						
"n" /n/	31.[n]			32.[ṇ]	33.[ṋ]		34.[ŋ]
"l" /l/	35.[l]			36.[ḷ]	37.[ḽ]		
"r" /r/	38.[ř]			39.[ṛ̌]	40.[r̭]		

*Note that environments for voicing and for fronting and backing intersect. Thus we get [ɦ̣], [ɦ̭], [ʰɦ̣] and [ʰɦ̭]. Such intersection of conditioning environments suggests that matrix multiplication is an attractive presentation device.

In the following each variant is given a brief articulatory description and is exemplified.

22. [s] voiceless alveolar fricative

/si/	[si]	'louse, line'

23. [ṣ] voiceless retroflexed fricative

/su/	[ṣu]	'who?'

24. [š] voiceless grooved fricative

/siu/	[šʸu]	'know' (PfII)

25. [h] voiceless glottal fricative. Most environments condition variation away from this norm. Perhaps the aspiration of voiceless stops most consistently approximates the norm, though aspiration is likely to be influenced in quality by the vowel that follows.

/khəə/	[kʰɔː]	'yes'

26. [h̤] voiceless lenis glottal fricative

/pihã/ [pih̤ã] 'outward'

In rapid speech the [h̤] is elided.

27. [ɦ] voiced glottal fricative (This same phonetic symbol following a vowel denotes breathiness of the vowel)

/dha-i/ [ḓʱa.i] 'say' (HII)

Word-initial /h/ is often voiced with a voiceless onset.

/hira/ [ʰɦiʱřa] 'diamond'

28. [ḥ] backed glottal fricative. (Note that the voicing rule and the backing rule apply independently.)

/huu/ [ʰɦ̣u:ʱ] 'whim'

/huə/ [ʰɦ̣ʷɔʱ] 'hole'

/həə/ [ʰɦ̣ɔ:] 'leaf'

Environments /ə__/ and /u__ / yield lenis /h/ making relative point of articulation difficult to determine. This difficulty may be related to quite general articulatory considerations. See Kenneth L. Pike (1943) *Phonetics* Ann Arbor University of Michigan Press, p.139.

29. [h̭] fronted glottal fricative

/hĭĭ/ [ʰɦ̭ĭ:ʱ] 'Asafoetida'

Environments /a__ / and /i__ / yield lenis /h/ making relative point of articulation difficult to determine.

30. [m] voiced bilabial nasal. The segment type /m/ is relatively unaffected by environments listed.

/mi/ [mi] 'fire'

31. [n] voiced alveolar nasal. The segment type /n/ is relatively unaffected by preceding low vowels, hence approximates the norm [n].

/dhənda/ [ḍʱənda] 'anxiety'

32. [ṇ] voiced backed alveolar nasal

/nu/	[ṇu]	'let's go!' (Impv)

33. [ṋ] voiced fronted alveolar nasal

/ni/	[ṋi]	'two'
/binti/	[bıṋti]	'request'

34. [ŋ] voiced velar nasal

/cuən-gu/	[tšʷɔŋ̣gu]	'stay' (PfII)

35. [l] voiced alveolar lateral. The segment-type /l/ is noticeably influenced by its environment throughout most of its distribution. /l/ is closest to neutral position before /ə/.

/ləə/	[lɔ:]	'water'

36. [ḷ] voiced backed alveolar lateral

/lũ/	[ḷũ]	'gold'
/ulta/	[uḷta]	'opposite'

37. [ḽ] voiced fronted alveolar lateral

/lii/	[ḽii]	'brass'
/gilti/	[g͓ıḽṱi]	'guilding'

38. [r̽] voiced alveolar flap. The segment type /r̽/ is relatively unaffected by a following [ə].

/rə̃ə̃/	[ᵊr̽əŋ]	'color'

39. [ṛ̽] voiced backed alveolar flap

/mə-ru/	[məṛ̽u]	'not be' (PII)
/khwəər/	[ḳʰʷɔ:ṛ̽]	'trap', 'cage', 'cell'

40. [r̭̽] voiced fronted alveolar flap

/riitu/	[ᵊr̭̽i:ṭ̣u]	'season'
/sirpa/	[sır̭̽pa]	'reward'

C. Distribution of Consonants in Newari

All consonants occur alone in syllable-initial position. Fricatives do not occur as the first member of a syllable initial consonant cluster, nor do they occur together in a cluster. Otherwise all consonants occur as the first member of a CC-cluster, the second member of which is /h/. The stops /p/, /t/, and /k/ occur in loan words as first members of a CC-cluster the second member of which is /r/. No CCC-clusters have been found within the syllable in normal (distinct) speech. Ch-clusters are found syllable-finally in a very few loan words.

The following charts summarize consonantal distribution within the syllable. Numbers in the cells refer to the examples that follow.

First Member	Second Member		
	Syllable Initial		Syllable Final
	/h/	/r/	/h/
/p/	1	13	19
/t/	2	14	20
/c/	3		
/k/	4	15	21
/b/	5	16	
/d/	6	17	
/j/	7		
/g/	8	18	
/m/	9		
/n/	10		
/l/	11		
/r/	12		
/s/	--		
/h/	--		

1.	"phy"	/phi/	'sand'
2.	"thyy"	/thii/	'gem'
3.	"chy"	/chi/	'you' (R)
4.	"khy"	/khi/	'stool', 'feces'
5.	"bhyy"	/bhii/	'section of an orange'
6.	"dhwn."	/dhũ/	'tiger'
7.	"jhyy"	/jhii/	'we' (Inclusive)
8.	"ghaa:"	/ghaa/	'wound'
9.	"mha"	/mhə/	'body'
10.	"nhw"	/nhw/	'day'
11.	"lhaa:"	/lhaa/	'hand'
12.	"cy-rhy-ma:"	/ci-rhi-ma/	'stepmother'
13.	"pryat"	/priət/	'spirit'
14.	"ja:tra:"	/jatra/	'festival'
15.	"krysna"	/krisnə/	'Krishna'
16.	"bramhw"	/brəmhu/	'Brahman'
17.	"drysya"	/drisyə/	'view'
18.	"graha"	/grəhə/	'planet'
19.	"ta:ryph"	/tariph/	'praise'
20.	"na:th"	/nath/	'lord'
21.	"bykh"	/bikh/	'poison

All consonants except /h/ have been observed to occur in syllable-final position.

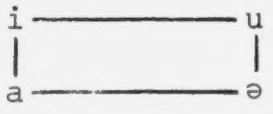
/p/:	"lappa:"	/ləppa/	'arm'
/t/:	"syyt"	/siit/	'dew'
/c/:	"myac"	/miəc/	'chair'
/k/:	"dykka"	/dikkə/	'sad'
/b/:	"sabda"	/səbdə/	'word'

/d/: "swdty"	/sudti/	'tobacco'
/j/: "pyaa:j"	/piaaj/	'onion'
/g/: "agty"	/əgti/	'ghost'
/m/: "ra:m"	/ram/	'Ram'
/n/: "baa:n"	/baan/	'arrow'
/l/: "alsy"	/əlsi/	'lazy'
/r/: "jwaar"	/juəər/	'fever'
/s/: "hwaas"	/huəəs/	'sense'
/h/: --		

D. Vowels in Newari

1. Contrast

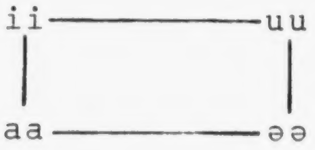
Newari may be described as having the following system of contrasting vowels:



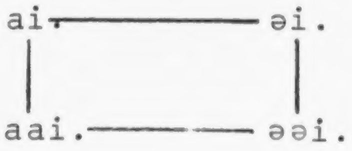
(The symbols given above are those of the phonemic transcription. In text orthography the following conversions apply: /i/ = "y", /u/ = "w", /a/ = "a:", and /ə/ = "a".) Vowels may be long or short, nasal or oral. Breathiness is non-contrastive, being conditioned by a preceding voiced /h/. Length is viewed as clustering on evidence from word morphology. High vowels have syllabic and non-syllabic variants. The low back vowel /ə/ has variants ranging from [e] and [ɛ] following /i/ to [o] and [ɔ] following /u/.

Newari may be analized as having as many as eight vowels. In a brief report such as this it is not possible to give an adequate discussion of the alternatives involved. The view that Newari has only four vowels entails the view that vowels cluster to a high degree within the syllable. Clusters posited by this analysis are supported in considerable measure by alternations observed in word morphology. They are not justified on the basis of parallels to non-suspect precedent clusters. Such precedent clusters are indeed impossible since /ə/ and /a/ never occur together in a single syllable and /i/ and /w/ are always suspect within monosyllabic clusters. If one insists that segment-types are the basic units of the phonology, a rejection of the cluster solution will obscure and complicate the morphology without appreciably simplifying the phonology. The description of Newari phonology on the assumption that contrastive phonological features are the basic descriptive entities of the phonology is deferred to a later paper. The system of mono-syllabic clusters entailed by the present analysis of the vowel system is as follows.

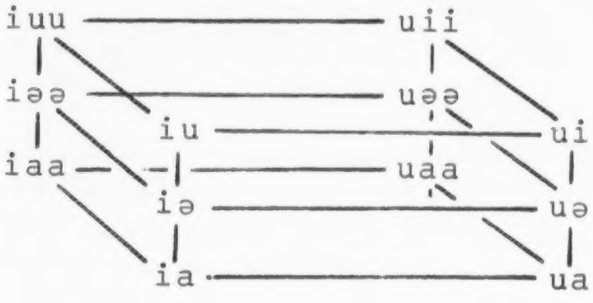
a. Geminate Clusters (long vowels)



b. Coalescing Clusters (By 'coalescing Cluster' we refer to monosyllabic vowel clusters in slow speech which may be realized as single (portmanteau) vowel qualities in normal speech. Thus "ay:" = /ai./= [ᵊæ ˆ:/æ:]. In general the slow speech variants are omitted from the following account).



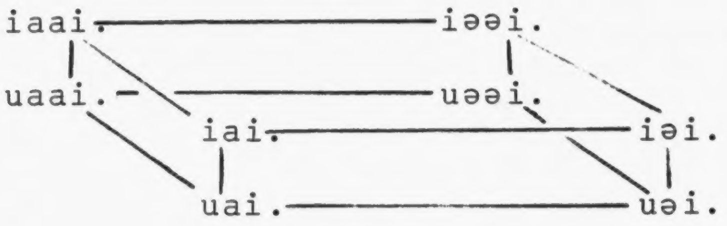
c. Glide-Reduction Clusters



(The period following the /i/ in coalescing clusters indicates syllable boundary. This distinguishes monosyllabic coalescing clusters from the disyllabic non-coalescing sequences, /a.i/, /ə.i/, /aa.i/ and /əə.i/.)

d. Coalescing and Glide-Reduction Clusters

d. Coalescing and Glide-Reduction Clusters



One currently unresolved question in the analysis of the Newari vowel system concerns the number of contrasting vowel lengths that are relevant for normal speech. In slow and distinct speech for our primary informant it can be shown that there are four contrastive degrees of vowel length.

In verbs we have short stems and long stems (a stem vowel may be inherently long or short). Both short stems and long stems have lengthened versions. Our primary informant maintains the following contrasts in slow speech.

a. Short Stem:

1. "sy" /si/ 'die' (PfII)

2. "syy" /sii/ 'die' (PPfII)

b. Long Stem:

3. "syy" /sii/ 'know' (PfII)

4. "syyy" /siii/ 'know' (PPfII)

Our informant judges (2) to be identical with (3) phonetically. Our hearing agrees with this.

There are also affixes which contrast for length: the second and third person future form is long: "yy" while the second and third person past form is short: "y". Thus we have:

5. "khw" /khu/ 'steal' (PfII)

6. "khww" /khuu/ 'steal' (PPfII)

7. "khw-y" /khu-i/ 'steal' (PII)

8. "khw-yy" /khu-ii/ 'steal' (FII)

When added to "-y" stem verbs, these affixes yield what our informant judges to be a four-way contrast for length. In addition to "y" in (1) above, "yy" in (2) and (3) above, and "yyy" in (4) above we have:

9. "sy-y" /si-i/ 'die' (HII)

10. "sy-yy" /si-ii/ 'die' (FII)

11. "syy-y" /sii-i/ 'know' (HII)

12. "syy-yy" /sii-ii/ 'know' (FII)

Examples (2), (3) and (9) are judged to be identical, while (4), (10) and (11) are judged to be non-identical. There is a partial re-articulation and fall in pitch where a morpheme break bounds a long vowel. Example (12) is unique within this set of examples. This same re-articulation and pitch break occurs with coalescing clusters such as "ay:" and "ay." hence this break contrasts with syllable boundary since these two clusters are monosyllabic by contrast with a:y" and "a.y" which are disyllabic and non-coalescing. At present it appears doubtful that all four degrees of length are consistently maintained in fluent speech. Further work is needed at this point. Those clusters given above are thus somewhat tentative. For our major informant in slow speech there will surely be more clustering than shown above. For fluent conversation there may be fewer distinctions. For our other informants it is extremely doubtful that more than a two-way length contrast can be maintained. For Purya Ratna Bajracharya, for example, there are no inflectionally long stem forms as such and the second future form is short. The segmental representation of the verbs cited here are also different: examples (3) and (4) are both "syww-gw" in his speech. The system of length reduction of stems and affixes in normal speech is currently under study.

Evidence for contrast in the system of vowels given in the diagrams above may be found in examples like the following.

"sy"	/si/	'louse'
"sw"	/su/	'straw'
"sa:"	/sa/	'cow'
"saa:"	/saa/	'manure'
"saa"	/səə/	'voice'
"syn'"	/si/	'firewood'

"san'"	/sə̃/	'hair'
"chy"	/chi/	'you' (R)
"chw"	/chu/	'what?'
"cha"	/chə/	'one' (Counting form)
"cha:"	/cha/	'hard' (Tactile)

Evidence for contrast between long vowels (geminate clusters) and short vowels may be found in examples like the following.

"phy"	/phi/	'sand'
"phyy"	/phii/	'thickness' (of book)
"ty"	/ti/	'soup'
"tyy"	/tii/	'mole, black spot'
"tw"	/tu/	'sugarcane'
"tww"	/tuu/	'mustard'
"ta:"	/ta/	'bamboo bridge'
"taa:"	/taa/	'lock and key'
"san'"	/sə̃/	'hair'
"saan'"	/sə̃ə̃/	'used to move'

Evidence for contrast between nasal and oral vowels may be found in examples like the following:

"tyy"	/tii/	'mole, black spot'
"tyyn'"	/tĩĩ/	'reed'
"tw"	/tu/	'sugar cane'
"twwn,"	/tũũ/	'water well'
"laa:	/ləə/	'water'
"laan,"	/lə̃ə̃/	'clothes'

"gaa:"	/gaa/	'ditch'
"gaa:n,"	/gãã/	'village'

Examples of clusters and morphological evidence for a cluster solution for vowels may be found in the following.

"nhy"	/nhi/	'snot'
"nhy-y"	/nhi-i/	'snot' (L)
"khy"	/khi/	'stool'
"khy-y"	/khi-i/	'stool' (L)
"bwara:"	/buəra/	'jute bag'
"bwara-y:"	/buərai./	'jute bag' (L)
"sy-ma:"	/si-ma/	'tree'
"sy-ma-y:"	/si-ma-i./	'tree' (L)
"chyan'"	/chĩə̃/	'house'
"chyan'-y'"	/chĩə̃-i./	'house' (L)
"mha"	/mhə/	'body'
"mha-y'"	/mhə-i./	'body' (L)
"kw"	/ku/	'load'
"kw-y"	/ku-i/	'load' (L)

The last example merely shows that the short "y" locative also occurs following "w".

"kyan-ay'"	/kiən-əi./	'show' (FI)
"kyan-yy"	/kiən-ii/	'show' (FII)
"wa-ay'"	/wə-əi./	'come' (FI)
"wa-yy"	/wə-ii/	'come' (FII) (disyllabic)
"da-ay:"	/da-ai./	'beat' (FI)
"da:-yy"	/da-ii/	'beat' (FII)
"by-y"	/bi-i/	'give' (FII)

"by-w"	/bi-u/	'Give!' (impv)
"chw-yy"	/chu-ii/	'bake' (FII)
"wa"	/uə/	'that, he'
"waa-n,"	/uə̃ə̃/	'that, he' (A)
"dwgw"	/dugu/	'goat'
"dwgww-n,"	/dugũũ/	'goat' (A)
"jya:"	/jia/	'work'
"jyaa:-n,"	/jiãã/	'work' (A)
"khwaa:"	/khwaa/	'face'
"wyn'"	/uĩ/	'mad woman'
"wa:"	/ua/	'paddy'
"waa:"	/uaa/	'fence'
"jyw"	/jiu/	'body'
"jyww-n,"	/jiũũ/	'body' (A)
"jyww"	/jiuu/	'be right' (PPfI)
"yaa"	/iəə/	'like' (PPfII)
"myay'"	/miəi./	'buffalo'
"mhyay:"	/mhiai./	'daughter'

2. Variation

Five major sets of environments have been identified as conditioning variation in vowels. No rules have yet been found for vowel variation of a segmentally conditioned sort which cross syllable boundaries. (For the present discussion we ignore contractions and reductions of rapid speech and the phonetics of spelling pronunciation in slow speech.) All environments stated in the rules for variation below are thus in the same syllable as the affected vowel.

a. Preceding another (different) vowel. (__V)
For high vowels this environment effects glide reduction. For low vowels, this environment can only be / __i/ since a following /u/ will always

belong to a different syllable and the sequences /əa/ and /aə/ apparently cannot occur (consider the assimilation of /ə/ to /a/ in FI forms. We get "kyan-ay'" 'show' (FI) and "wa-ay'" 'come' (FI) but "da-ay:" 'beat' (FI).) In this environment low vowels are realized as [æ:] (/ai./) and [ɛ:] (/əi./).

b. Following a non-geminate high vowel: /i__/, /u__ / The variation effected in /ə/ is of primary interest in this environment. Following /i/, /ə/ is [ɛ] or [e] (openness is favored by closed syllables, nasalization and non-labial syllable-initial consonants.) Following /u/: : /ə/ is [ɔ] or [o] (openness is favored by the same factors as for the preceding. Note that the geminate /əə/ is not influenced appreciably by either of these two environments.) In the environment /i__ /, /a/ is generally fronted as [æ], especially in non-word-final syllables.

c. Following voiced /h/: Syllable-initial /h/ and clusters of voiced consonants plus /h/ condition breathiness in the following vowel.

d. In closed syllables, high vowels are more open than in open syllables.

e. If any vowel in a syllable is nasalized, the whole syllable is nasalized. In nasalized syllables, short (non-geminate) vowels are more open than in non-nasalized syllables.

The effects of these environments on the vowels is summarized in the following chart. Numbers in the cells refer to the examples below. In the section on consonants we noted certain instances in which the conditions for the variation of a single segment were independent and intersecting. In such cases we suggested that matrix multiplication might be a useful presentation device. With the vowels we have reached a stage of complexity in this regard that is sufficient to make such an attempt worth while.

We will take as the basic matrix one which presents the variants of short vowels that have been observed in open syllables that are neither breathy nor nasal. Letters heading the columns refer to the environments described above.

1. Basic Matrix:

		"norm"	a /_V/	b /i_/	b /u_/
"y"	/i/	[i]	[y]	[i]	[i]
"w"	/u/	[u]	[w]	[u]	[u]
"a:"	/a/	[a]	*[æ:]	[æ]	[a]
"a"	/ə/	[ə]	*[ɛ:]	[e]	[o]

2. Closed Syllable Matrix: (rule d)

"y"	/i/	[i]	[y]	[i]	[ɩ]
"w"	/u/	[ʊ]	[w]	[ʊ]	[u]
"a:"	/a/	[a]	*[æ:]	[æ:]	[a]
"a"	/ə/	[ə]	*[ɛ:]	[ɛ]	[ɔ]

3. Breathy Multiplication of Preceding (rule c)

a. Open Syllables:

"y"	/i/	[i$^{\hat{h}}$]		[i$^{\hat{h}}$]	[i$^{\hat{h}}$]
"w"	/u/	[u$^{\hat{h}}$]		[u$^{\hat{h}}$]	[u$^{\hat{h}}$]
"a:"	/a/	[a$^{\hat{h}}$]	*[æ:$^{\hat{h}}$]	[æ$^{\hat{h}}$]	[a^{h}]
"a"	/ə/	[ə$^{\hat{h}}$]	*[ɛ:$^{\hat{h}}$]	[e$^{\hat{h}}$]	[o$^{\hat{h}}$]

b. Closed Syllables:

"y"	/i/	[ɩ$^{\hat{h}}$]		[i$^{\hat{h}}$]	[ɩ$^{\hat{h}}$]
"w"	/u/	[ʊ$^{\hat{h}}$]		[ʊ$^{\hat{h}}$]	[u$^{\hat{h}}$]
"a:"	/a/	[a$^{\hat{h}}$]	*[æ:$^{\hat{h}}$]	[æ$^{\hat{h}}$]	[a$^{\hat{h}}$]
"a"	/ə/	[ə$^{\hat{h}}$]	*[ɛ:$^{\hat{h}}$]	[ɛ$^{\hat{h}}$]	[ɔ$^{\hat{h}}$]

4. Nasal Multiplication of the Preceding (rule e)

a. Clear

		"norm"	a /_V/	b /i_ /	b /u_ /
"y"	/i/	[ĩ]		[ɪ̃]	[ĩ]
"w"	/u/	[ʊ̃]		[ʊ̃]	[ũ]
"a:"	/a/	[ã]	*[æ̃:]	[æ̃]	[ã]
"a"	/ə/	[ə̃]	*[ɛ̃:]	[ɛ̃]	[ɔ̃]

b. Breathy

		"norm"	a /_V/	b /i_ /	b /u_ /
"y"	/i/	[ĩ^{ɦ}]		[ɪ̃^{ɦ}]	[ĩ^{ɦ}]
"w"	/u/	[ʊ̃^{ɦ}]		[ʊ̃^{ɦ}]	[ũ^{ɦ}]
"a:"	/a/	[ã^{ɦ}]	*[æ̃:^{ɦ}]	[æ̃^{h}]	[ã^{ɦ}]
"a"	/ə/	[ə̃^{ɦ}]	*[ɛ̃:^{ɦ}]	[ɛ̃^{ɦ}]	[ɔ̃^{ɦ}]

*This is the phonetic relization not just of the segments /a/ /ə/ but of the clusters /ai./, /əi./, in other words /ə/ coalesces here with the following /i/ and the vowel quality [æ:] is thus, in a sense "portmanteau".

Nasalized variants are segmentally those of the closed syllable set. The contrast suggested by rule (d) appears to be neutralized under nasalization.

For the geminate (long) vowels there are fewer variants. Long /əə/ and /aa/ do not vary appreciably following the high vowel /i/ and /u/, hence rule (b) appears not to apply. Rule (a) applies to long low vowels just as it does to short low vowels but long high vowels do not reduce to glides, so rule (a) fails for long high vowels. Closed syllables appear not to condition open vowel quality in long vowels, hence rule (d) fails for long vowels. For long vowels, then, we have the following matrices:

5. Variants of Long Vowels:

		a. Oral Clear		b. Oral Breathy	
		"norm"	a /_V/	"norm"	a /_V/
"yy"	/ii/	[i:]	*--	[i:ʱ]	*--
"ww"	/uu/	[u:]	*--	[u:ʱ]	*--
"aa:"	/aa/	[a:]	**[æ:]	[a:ʱ]	**[æ:ʱ̣]
"aa"	/əə/	[ɔ:]	**[ɛ:]	[ɔ:ʱ]	**[ɛ:ʱ̣]

*These sequences occur, but are disyllabic, hence are omitted.

**These are realizations of clusters. Relative length is a problem that has not been completely solved.

Since the nasal multiplication of the above involves no other change than the addition of nasalization, it will be omitted.

Rather than illustrate the entire matrix set of variants, we limit our examples to those that illustrate the rules in terms of which the matrices were constructed.

Rule (a):

1. Reduction of high vowels to glides:

/bi-i/	[bi:]	'give' (FII)
/bi-u/	[byu]	'give!' (Impv)
/gũ/	[g̣ũ]	'forest'
/gũ-i/	[g̣wĩ]	'forest' (L)

2. Coalescence of low vowels with /i/:

/mətə/	[mətə]	'lamp'
/mətə-i./	[mətɛ:]	'lamp' (L)
/wə-ii/	[wə.i:]	'come' (FII)
/wə-i./	[wɛ:]	'come' (FI)

/hira/	[ʰh̭iʱř̭a]	'diamond'
/hira-i./	[ʱh̭iʱř̭æ:]	'diamond' (L)
/la-ii/	[ḽa.i:]	'meet' (FII)
/la-i./	[ḽæ:]	'meet' (FI)

Rule (b)

1. The fronting of /ə/ after /i/: This rule is most convincingly illustrated in terms of a certain alternation between long and short nasals. This alternation is characteristic of the speech of our primary informant. Though it may be an importation from the dialect of Bhaktapur, it is valid for his speech. Most geminate nasalized vowels have two variants: (1) long nasalized vowel and (2) short vowel followed by the indeterminate nasal (the indeterminate nasal is velar when word-final, but assimilates to the point of articulation of the following consonant word-medially).

/lakãã/	[lakã̆:ꜧ/ lakaŋ]	'shoe'
/lə̃ə̃/	[lɔ̃: / ləŋ]	'clothes'
/gə̃ə̃/	[gɔ̃: / gəŋ]	'stop!' (Impv)
/piə̃ə̃/	[pyɔ̃: / pyɛŋ]	'buttocks'
/phiə̆ə̃/	[pʰyɔ̃: / pʰyɛŋ]	'loosen!' (Impv)

2. The backing of /ə/ after /u/: This is also nicely illustrated in terms of alternation between short and long nasals.

/buə̃ə̃/	[bwõ: / bwɔŋ]	'study!' (Impv)
/cuə̃ə̃/	[tšwõ: / tšwɔŋ]	'stay!' (Impv)
/cuə/	[tšwo]	'urine'

3. The fronting of /a/ after /i/:

/iakənə/	[yækənə]	'immediately'
/giani/	[gyæṋi]	'docile, obedient, industrious person'

Rule (c) Breathiness after [ɦ]:

/hãĩ/	[ʰɦæ̃:ʱ]	'duck'
/bhaa/	[bʱa:ʱ]	'price'
/nhu/	[ṇʱuʱ]	'day' (Counting form)
/dha-ia/	[dʱaʱ.yaʱ]	'say' (FI)

Rule (d): Open and close variants: This is also illustrated in terms of alternation between short and long nasals.

/cĩĩ/	[tsĩ: / tsιŋ]	'sign'
/kũũ/	[ḳũ: / ḳʊŋ]	'corner'
/sikkə/	[sιkkə]	'much'
/phukkə/	[pᶠʰʊkkə]	'all'

Where vowel elision allows alternation between open and closed syllables, there is alternation between open and close variants of the vowel.

/cidhi-ma/	[tšiř̭ʱiʱma / tšιř̭ʱma]	'stepmother'

Rule (e): Nasal variants: If one vowel in a sequence of vowels within the syllable is nasalized, the whole sequence is nasalized. Thus, where the non-nasal locative /i/ is affixed to a nasal stem, it becomes nasalized.

/gũ/	[g̣ũ]	'forest'
/gũ-ii/	[g̣wĩ:]	'forest' (L)

Rule (f): Low vowel assimilation: Where an affix beginning with /ə/ is attached to a stem ending with /a/, /ə/ assimilates to /a/.

/da-əi./	[dæ:]	'beat' (FI)

3. Distribution

The following is a summary of the monosyllabic VV-clusters which occur in Newari. Numbers in the cells refer to the examples that follow.

First Member	Second Member			
	/i/	/u/	/a/	/ə/
/i/	1./ii/	5./iu/	6./ia/	7./iə/
/u/	8./ui/	2./uu/	9./ua/	10./uə/
/a/	11./ai./	---*---	3./aa/	--**---
/ə/	12./əi./	---*---	--**--	4./əə/

* /u/ cannot follow a low vowel within the same syllable.

** Two different low vowels cannot occur together in the same syllable. [Since the discovery of da-əi. this should be modified in some way--if FI has a phonologically conditioned allomorph /ai./ then this can still be said this way, otherwise not.]

There are three kinds of monosyllabic VV-clusters. The examples for the chart above are classified according to these three types:

a. Geminate clusters:

1. "my-y"	/mi-i/	'sell' (FII)
2. "tww"	/tuu/	'mustard'
3. "ha:"	/ha/	'steam'
4. "laa"	/ləə/	'water'

b. Glide-Reduction Clusters:

5. "by-w"	/bi-u/	'give!' (Impv)
6. "nya:"	/nia/	'fish'
7. "dyan-ya"	/diən-iə/	'sleep (I)
8. "wyn'"	/ũĩ/	'mad woman'

9. "pwaa"	/puaa/	'stomach'
10. "cwaka:"	/cwəka/	'peak', 'tip'

c. Coalescing Clusters:

11. "bhay:"	/bhai./	'language'
12. "kway'n'"	/kuə̃ĭ/	'bone'

Due to indeterminicies in regard to length we are omitting an account of VVV and longer clusters.

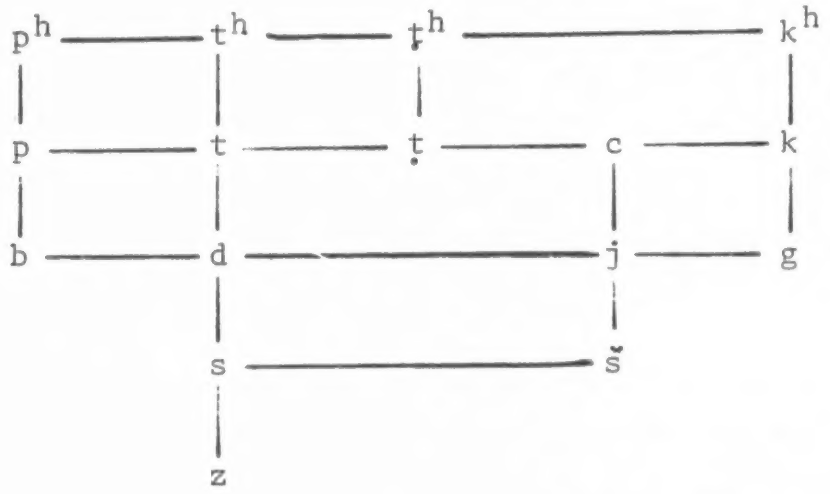
SUNWAR SEGMENTAL SYNOPSIS

Dora Bieri and Marlene Schulze

A. Obstruants in Sunwar

1. Contrast

Sunwar may be described as having the following system of contrasting obstruants. The segments in the diagram are those of the phonemic transcription. The text orthography differs as follows: Aspiration is written on the line, /p^h/ = "ph", retroflection is written as "r", /ṭ^h/ = "thr", /ṭ/ = "tr", grooving is written as "h", /š/ = "sh", and affricates are written as clusters, /c/ = "ts", /j/ = "dz".



This system of segments entails the following set of syllable-initial consonant clusters. Examples of these clusters are to be found below in the section on the distribution of consonants.

1. p^hr
2. p^hl
3. pr
4. pl
5. br

9. jy

11. k^hr
12. kr
13. ky
14. kw
15. gr
16. gy

6. bw
(bl)   17. gl
7. sy   10. šy
8. sw

It also entails the following set of syllable-final clusters

19. pt   23. mb   27. rb   31. rn
20. pc   24. mc   28. rc   32. lb
21. ps   25. ŋg   29. rs
22. gy   26 ŋs   30. rš

Evidence for contrast in the system of obstruants may be seen in sets like the following. (Tone is indicated as follows:

	Text Orthography		Phonemic Transcription	
	Level	Glide	Level	Glide
High Tone	'Cv	"Cv	Cv́	'Cv́
Low Tone	Cv	=Cv	Cv̀	'Cv̀

where C is word-initial consonant and v is vowel. In a few cases where tone is not known, both transcriptions are Cv. Tone is not marked in the phonetic examples given. The phonetics of tone is discussed elsewhere in this volume.)

""phee-tsa"	/'phée-ca/	'to wear'
""pee-tsa"	/'pée-ca/	'to finish a task'
""bee-tsa"	/'bée-ca/	'to die'
""thee-tsa"	/'thée-ca/	'to step on'
""tee-tsa"	/'tée-ca/	'to stop (transitive)
""de;e-tsa"	/'dée-ca/	'to stay'
""threeb"	/ṭ^{h}eeb/	'big'

""treetu"	/téetu/	'toad'
"'khe-tsa"	/khé-ca/	'to peal'
"'ke-tsa"	/ké-ca/	'to cook'
"'ge-tsa"	/gé-ca/	'to grant'
"=tsee-tsa"	/'cèe-ca/	'to cut lengthwise'
"=dzee-tsa"	/'jèe-ca/	'to fall to pieces'
""see-tsa"	/'sée-ca/	'to awake'
"zeri"	/zèri/	'rib'
""shyer"	/'šyér/	'uncooked rice'

2. Variation

The only deviations from posited phonetic norms observed in Sunwar obstruants to date are those that might be described as fricativization of a stop. The environments involved are the following:

a. Following a vowel and preceding a voiceless obstruant.

b. Between vowels.

c. Following a vowel cluster ending in /i/ and preceding an unaspirated obstruant.

	a	b	c
/p/	1.[p / ᵽ]	1.[p / ᵽ]	
/b/		2.[ƀ]	
/k/			3.[x]

These variants are illustrated as follows:

1. [p / ᵽ] voiceless bilabial unaspirated stop in fluctuation with voiceless bilabial fricative

/tùptil/	[tʊptɩl/tʊᵽtɩl]	'blacksmith'
/ŋópa/	[ŋopa/ŋopa]	'ear'

2. [ƀ] voiced bilabial fricative

/'ṭʰéebɑ/	[ṭʰe:ƀɑ]	'big'

3. [x] voiceless velar fricative

/'tàik-ca/	[taixtsa]	'to kick'

In all other cases, only the norm has been observed:

/pʰ/ [pʰ] voiceless bilabial aspirated stop

/pʰũ̀/	[pʰũ]	'snow'

/p/ [p] voiceless bilabial unaspirated stop

/pìpim/	[pipɩm]	'queen'

/b/ [b] voiced bilabial unaspirated stop

/bʊ́š/	[bʊš]	'white'

/tʰ/ [tʰ] voiceless alveolar aspirated stop

/'tʰóo-ca/	[tʰo:tsa]	'to pour out'

/t/ [t] voiceless alveolar unaspirated stop

/'tàik-ca/	[taixtsa]	'to kick'

/d/ [d] voiced alveolar unaspirated stop

/'dàik-tɑk/	[daixtɑk]	'we received'

/ṭʰ/ [ṭʰ] voiceless alveo-palatal aspirated stop

/ṭʰéebɑ/	[ṭʰe:ƀɑ]	'big'

/ṭ/ [ṭ] voiceless alveo-palatal unaspirated stop

/ṭèetu/	[ṭe:tu]	'toad'

/c/ [ts] voiceless alveolar affricate

/'cíi-ca/	[tsi:tsa]	'to bathe'

/j/ [dz] voiced alveolar affricate

/'jàa-ca/	[dza:tsa]	'to arrive'

/kʰ/ [kʰ] voiceless velar aspirated stop

/kʰrùm-ca/ [kʰřumtsa] 'to plant'

/k/ [k] voiceless velar unaspirated stop

/'krùp-ca/ [křuᵽtsa] 'to bow'

/g/ [g] voiced velar unaspirated stop

/'grùm-ca/ [gřumtsa] 'to meet'

/s/ [s] voiceless alveolar fricative

/sɑ́riŋ/ [sɑrɪŋ] 'sky'

/z/ [z] voiced alveolar fricative

/zèri/ [zeri] 'rib'

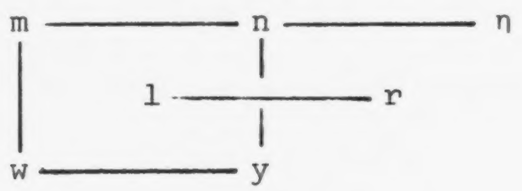
/š/ [š] voiceless alveo-palatal fricative

/gíš/ [gɪš] 'how much'

B. Sonants in Sunwar

1. Contrast

Sunwar may be described as having the following system of contrasting sonants. The segments in the diagram are those of the phonemic transcription. The text orthography differs from the phonemic transcription in that /ŋ/ = "ng".



Except for the cluster /ŋw/, all syllable-initial clusters in which sonants participate are listed above as the syllable-initial clusters in which obstruants participate. The only syllable-final cluster in which a sonant participates that is not listed above is /rn/.

Evidence for contrast in the system of sonants may be seen in sets like the following.

6

"=maal-tsa"	/'màal-ca/	'to search'
"=naa-tsa"	/'nàa-ca/	'to weigh'
"=ngaa-tsa"	/'ŋàa-ca/	'to weep'
""waa-tsa"	/'wáa-ca/	'to plough'
""yaa-tsa"	/'yáa-ca/	'to transfer'
"=laa-tak"	/'làa-tak/	'we cause (someone) to cross a river'
"ra:;"	/rɑ̃̀/	'body'
"la:"	/lã̀/	'way'
"'mur"	/múr/	'man'
"'mul"	/múl/	'now'
"gru-tsa"	/grù-ca/	'to appear'
"glu-tsa"	/glù-ca/	'to rise' (sun, moon)

2. Variation

The only deviations from posited phonetic norms observed to date in Sunwar sonants are those associated with /r/:

/r/ is [ř], voiced alveolar flapped vibrant in three environments:

Following high vowels in word final position

/múr/	[mʊř]	'man'

Word-initially before /ɑ/

/rɑ̃̀/	[řɑ]	'body'

As C_2 of a C_1C_2V... syllable, where C_1 is a bilabial or velar stop

/'krùp-ca/	[křʊp̥tsa]	'friend'

/r/ is [R], voiceless alveolar trilled vibrant before voiceless affricates and fricatives:

/wɑ̀rc/	[wɑRts]	'friend'

/r/ is [r], voiced alveolar trilled vibrant elsewhere

/'rìimšo/ [ri:mšo] 'nice'

For all other segments only the norm has been observed:

/m/ [m] voiced bilabial nasal

/múr/ [mʊr̽] 'man'

/n/ [n] voiced alveolar nasal

/'nàa-ca/ [na:tsa] 'to weigh'

/ŋ/ [ŋ] voiced velar nasal

/'ŋaa-ca/ [ŋa:tsa] 'to weep'

/l/ [l] voiced alveolar lateral

/làpco/ [laptso/laᵽtso] 'door'

/w/ [w] voiced bilabial semi-vowel

/'wòik-ca/ [woixtsa] 'to put'

/y/ [y] voiced palatal semi-vowel

/yìc/ [yıts] 'rat'

C. Glottals in Sunwar

1. Contrast

Sunwar may be described as having the following system of contrasting glottals:

ʔ ——————— h

The segments used above are those of the phonemic transcription. In text orthography, /?/ is not written. In text orthography the glottal stop is understood as the initial sound in any word transcribed with a vowel as the initial segment.

"'its-ka" /ʔíc-ka/ 'some'

Evidence for contrast in the system of sonants may be seen in sets of words like the following:

""hoik-tsa"	['hóik-ca/	'to heat'
""hi;i-tsa"	/'hĩ́i-ca/	'to fear'
"=hii-tsa"	/'hìi-ca/	'to count'
""hil-tsa"	/'híl-ca/	'to grind'
"'ha:mts pa:-tsa"	/hámc pα-ca/	'to yawn'
"'ip-tsa"	/ˀíp-ca/	'to sleep'
"a al"	/ˀa ?al/	'his child'
"o;"	/ˀõ/	'such
"oth"	/ˀot^h/	'here'

2. Variation

No variants other than the phonetic norms have been observed for Sunwar glottals.

/ˀ/ [ˀ] glottal stop

/ˀíc-ka/	[ˀιtska]	'some'

/h/ [h] voiceless glottal fricative

/'híl-ca/	[hιl-ca]	'to grind'

D. Distribution of Consonants

All consonants occur before vowels in syllable-initial position. Examples of consonants in syllable-initial position can be found in the section on contrast. Subsets of the set of consonants occur in other positions. The relevant environments may be described with reference to the syllable as follows:

A. First member of a syllable-initial CC-cluster.

B. Second member of a syllable-initial CC-cluster.

C. First member of a syllable-final -CC cluster.

D. Second member of a syllable-final -CC cluster.

E. Syllable final following a vowel.

In the data currently at hand, the segments /d/, /t^h/ /ṭ/, /z/, /h/, and /ʔ/ occur only syllable-initial before a vowel. These segments therefore do not appear in the chart below.

	A	B	C	D	E
/p^h/	1				
/p/	3		19		33
/b/	5			27	34
/t^h/					35
/t/				18	36
/c/				20	37
/j/	9				38
/k^h/	11				39
/k/	12				40
/g/	15		22	25	
/s/	7			26	41
/š/	10			30	42
/m/			23		43
/n/				31	44
/ŋ/	18		25		45
/l/		2	32		46
/r/		3	27		47
/w/		6			
/y/		7		22	

The numbers in the cells above refer to examples below. In the list below we have given examples of all consonant clusters in the data at hand.

Initial CC- Clusters

1.	/p^{h}r/	""phree-tsa"	/'p^{h}rée-ca/	'to splinter'
2.	/p^{h}l/	""phlee-tsa"	/'p^{h}lée-ca/	'to bind'
3.	/pr/	"=pree-tsa"	/'prèe-ca/	'to jump'
4.	/pl/	"'plupse"	/plúpse/	'comb'
5.	/br/	"'bre-b"	/bré-b/	'he falls down'
6.	/bw/	"bwa:"	/bwὰ/	'rooster'
7.	/sy/	"syob-tsa"	/syòb-ca/	'to clean beer'
8.	/sw/	"'swang pa:-tsa"	/swάŋ pα-ca/	'to pretend'
9.	/jy/	"'dzyet-tsa"	/jyét-ca/	'to light'
10.	/sy/	""shyee-tsa"	/'šyée-ca/	'to teach'
11.	/k^{h}r/	"=khraa-tsa"	/'k^{h}ràa-ca/	'to step over'
12.	/kr/	"=kraa-tsa"	/'kràa-ca/	'to be caught'
13.	/ky/	"'kye-tsa"	/kyé-ca/	'to boil'
14.	/kw/	"'kwo-tsa"	/kwó-ca/	'to look'
15.	/gr/	"gru-tsa"	/grù-ca/	'to appear'
16.	/gy/	"gyo-sho"	/gyò-šo/	'long'
17.	/gl/	"glu-tsa"	/glù-ca/	'to rise (of sun, moon)'
18.	/ w/	""ngwoi;k-tsa"	/'ŋwòǐk-ca/	'to climb'

Final -CC Clusters

19.	/pt/	"'nupt"	/núpt/	'end'
20.	/pc/	"al-brepts"	/ˀàl-brepc/	'small children'
21.	/ps/	"'gups"	/gúps/	'lion'
22.	/gy/	"gigy"	/gìgy/	'green'
23.	/mb/	"=khrum-b"	/k^{h}rùm-b/	'he plants'
24.	/mc/	"'ha:mts pa:-tsa"	/hάmc pα-ca/	'to yawn'

25.	/ŋg/	"kwungg"	/kwùŋg/	'hook'
26.	/ŋs/	"'a:ngs"	/?ɑ́ŋs/	'dividing'
27.	/rb/	"tserb"	/cèrb/	'small grain'
28.	/rc/	"wa:rts"	/wɑ̀re/	'friend'
29.	/rs/	"'tsirs"	/círs/	'wheat'
30.	/rš/	"kyarsh"	/kyɑ̀rš/	'goat'
31.	/rn/	"'kyor-na kyor-n"	/kyór-na kyor-n/	'he is cutting'
32.	/lb/	"'brol-b"	/bról-b/	'it breaks'

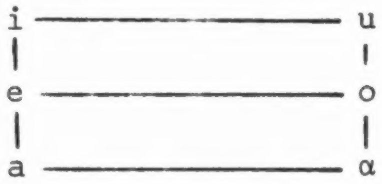
Syllable-final Consonants

33.	/p/	""gyaap-tsa"	/'gyɑ́ap-ca/	'go buy'
34.	/b/	"'bre-b"	/bré-b/	'he falls down'
35.	$/t^h/$	"oth"	$/?ot^h/$	'here'
36.	/t/	"'dzyet-tsa"	/jyét-ca/	'to light'
37.	/c/	"=kwo;ets"	/'kwõ̀ec/	'Sunwar'
38.	/j/	"krongledz"	/kròŋlej/	'corn'
39.	$/k^h/$	"dukh"	$/dùk^h/$	'trouble'
40.	/k/	"=preek"	/'prèek/	'a tear'
41.	/s/	"'bus"	/bús/	'snake'
42.	/s/	"'wo;ish"	/'wṍiš/	'husband'
43.	/m/	"=khrum-tsa"	$/'k^h$rúm-ca/	'to plant'
44.	/n/	"'ngwon"	/ŋwón/	'far'
45.	/ŋ/	"'sa:ring"	/sɑ́riŋ/	'sky'
46.	/l/	"wa:l"	/wɑ̀l/	'ghost'
47.	/r/	"'gyar-tsa"	/gyár-ca/	'to play'

E. Vowels in Sunwar

1. Contrast

Sunwar may be described as having the following system of contrasting vowels



The segments used in the chart above are those of the phonemic transcription. Text orthography differs from the phonemic transcription in that /α/ = "a:"

This system of segments participates in the following sets of vowel clusters:

Oral Clusters

1. ii 2. ia
3. ee 4. eo
5. ai 6. aa
7. ui 8. uu
9. oi 10.oe 11. oo
12. αu 13. αα

Nasal-Oral Clusters

14. ĩi
15.ẽe
16.ãa
17. α̃i 18. α̃e
19. õi 20. õe

Oral-Nasal Clusters

21. oĩ

22. uĩ

Evidence of contrast within this system of vowels is found in sets of words like the following:

"'dzi-tsa"	/jí-ca/	'to quarrel'
"dze-tsa"	/jè-ca/	'to warm oneself'
"'dzo-tsa"	/jó-ca/	'to graze'
""sii-tsa"	/'síi-ca/	'to wash (utensils)'
"see-tsa"	/'sée-ca/	'to awake'
"=saa-tsa"	/'sàa-ca/	'to recover'
""soo-tsa"	/'sóo-ca/	'to dry food'
""tsii-tsa"	/'cíi-ca/	'to bathe'
""tsoo-tsa"	/'cóo-ca/	'to shut in'
"=tsaa-tsa"	/'càa-ca/	'to bring'
"=tsee-tsa"	/'cèe-ca/	'to cut'
""duu-tsa"	/'dúu-ca/	'to drink too much'
""doo-tsa"	/'dóo-ca/	'to fall into something'
"'da:-tsa"	/dά-ca/	'to get tired'
""dzii-tsa"	/'jíi-ca/	'to break a stick'
""dzoo-tsa"	/'jóo-ca/	'to know events'
"=dzaa-tsa"	/'jàa-ca/	'to arrive'
"=dzee-tsa"	/'jèe-ca/	'to fall apart'
"=bwaa:k"	/'bwàαk/	'water'
""yool-tsa"	/'yóol-ca/	'to take away'

"=yaa-tsa"	/'yàa-ca/	'to transfer'
"'pa:-tsa"	/pɑ́-ca/	'to do'
"'pi-tsa"	/pí-ca/	'to come'
"pu-tsa"	/pù-ca/	'to dry on the fire'
"=laa-tak"	/'làa-tak/	'we make someone cross a river'
"=laa-ta:k"	/'làa-tɑk/	'we cross a river'

Vowels of any given quality may be long or short, nasal or oral.

"'dzi-tsa"	/jí-ca/	'to quarrel'
""dzii-tsa"	/'jĩ́i-ca/	'to break'
"'bre-tsa"	/bré-ca/	'to fall down flat'
""bree-tsa"	/'brée-ca/	'to write'
"=taaki"	/'tàaki/	'cap'
"=laa-tak"	/'làa-tak/	'we cause someone to cross the river'
"du-tsa"	/dù-ca/	'to live in peace'
""duu-tsa"	/'dṹu-ca/	'to drink too much'
"'tso-tsa"	/có-ca/	'to burn'
""tsoo-tsa"	/'côo-ca/	'to put into safety'
"=waa:k"	/wɑ́ɑk/	'water'
"wa:l"	/wɑ̀l/	'ghost'
"khi;"	/k^{h}ì/	'house'
"kyi"	/kyì/	'intestine'
""hi;i-tsa"	/'hĩ́i-ca/	'to fear'
"=hii-tsa"	/'hìi-ca/	'to count'

"le"	/lè/	'four'
"le;"	/lẽ̀/	'tongue'
"ka"	/ka/	'one'
"'tsa;"	/cã́/	'hair'
"a; al"	/ˀã ˀal/	'my child'
"a al"	/ˀa ˀal/	'his child'

2. Variation

Very little variation has been observed in Sunwar vowels. Only one environment has been observed to effect deviation from the posited norm. This environment conditions open variants in mid and high vowels:

A. Interconsonantal in closed syllables

	"norm"	A
/i/	1. [i]	2. [ɩ]
/e/	3. [e]	4. [ɛ]
/u/	5. [u]	6. [ʊ]
/o/	7. [o]	8. [ɔ]
/a/	9. [a]	10. [a]
/α/	10. [α]	[α]

The numbers in the cells above refer to the following examples:

1. [i] voiced high close front vocoid

/pìpim/	[pipɩm]	'queen'

2. [ɩ] voiced high open front vocoid

/gíš̆/	[gɩš̆]	'how much'

3. [e] voiced mid close front vocoid

/'ṭʰéebα/	[ṭʰe:ƀα]	'big'

4.	[ɛ]	voiced mid open front vocoid		
		/'cét-ca/	[tsɛttsa]	'to cut lengthwise'
5.	[u]	voiced high close back vocoid		
		/kúšul/	[kušul]	'skin'
6.	[ʊ]	voiced high open back vocoid		
		/búš/	[bʊš]	'white'
7.	[o]	voiced mid close back vocoid		
		/kwó-ca/	[kwoca]	'to look'
8.	[ɔ]	voiced mid open back vocoid		
		/pólpol/	[pɔlpɔl]	'calf of leg'
9.	[a]	voiced low open front vocoid		
		/bwà/	[bwa]	'chicken'
		/gyàr-ca/	[gyaRtsa]	'to play'
10.	[ɑ]	voiced low open back vocoid		
		/wɑ̀rc/	[wɑRts]	'friend'
		/rɑ̃̀/	[řɑ̃]	'body'

3. Distribution

VV clusters occur in both open and closed syllables. Since there exists a non-suspicious VV pattern, long vowels are interpreted as VV clusters. The non-suspicious pattern is exemplified by the following:

"goe"	/goe/	'you (polite)'

Oral-Oral Clusters

1.	/ii/	""prii-tsa"	/'príi-ca/	'to fill it'
2.	/ia/	"pia"	/pìa/	'head'
3.	/ee/	""theeb"	/'t^héeb/	'big'

4. /eo/	""reo"	/reo/	'rainfall'
5. /ai/	"sai"	/sai/	'long ago'
6. /aa/	""gyaap-tsa"	/'gyáap-ca/	'to buy'
7. /ui/	"gui"	/gui/	'arm'
8. /uu/	"ruu-tsa"	/rùu-ca/	'to have enough'
9. /oi/	"groik-tsa"	/groik-ca/	'to burn (house)'
10. /oe/	"=kwoets"	/'kwɔ̀ec/	'Sunwar'
11. /oo/	""tsoo-tsa"	/'cóo-ca/	'to shut in'
12. /αu/	"ta:u"	/tαu/	'son'
13. /αα/	"=bwaa:k"	/'bwὰαk/	'water'

Nasal-Oral Clusters

14. /ĩi/	""hi;i-tsa"	/'hĩ́i-ca/	'to fear'
15. /ẽe/	""phle;e-tsa"	/'p^hlẽ́e-ca/	'to bind'
16. /ãa/	"shya;ab"	/šyãab/	'beer'
17. /α̃i/	""pa:;i-tsa"	/pα̃́i-ca/	'to wear ornaments'
18. /α̃e/	"pha:;e-tsa"	/p^hα̃e-ca/	'to go to the same place regularly'
19. /õi/	"=wo;ish"	/'wɔ̃̀iš/	'husband'
20. /õe/	"=kwo;ets"	/'kwɔ̃̀ec/	'Sunwar'

Oral-Nasal Clusters

21. /oĩ/	""ngwoi;ti"	/'ŋwóĩti/	'in front of'
22. /uĩ/	"pui;-tsa"	/puĩ-ca/	'to beg'

SHERPA SEGMENTAL SYNOPSIS

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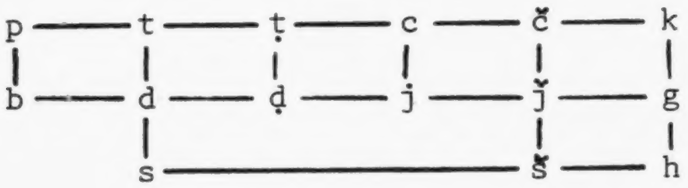
A. Obstruants in Sherpa

1. Contrast

Sherpa may be described as having the following system of contrasting obstruants. The characters used are those of the phonemic transcription. Text orthography differs from the phonemic transcription in that /c/ = "ts"; /j/ = "dz"; /č/ = "c"; /ǰ/ = "j"; /ṭ/ = "T", /ḍ/ = "D"; /š/ = "z" and nasalized vowel /ṽ/ = "vN".



Choosing this system of obstrauants entails choosing the following system of clusters in which obstruants occur syllable-initially.

ph	th	ṭh	ch	čh	kh
py	ty		cy	čy	ky
					khy
	dy				gy
	sy			šy	

Examples of these clusters may be found in the section on the distribution of consonants.

Evidence for contrast in the system of obstruants may be seen in examples like the following.

"pu"	/'pù/	'blow (it) out!'
"bu"	/'bù/	'insect'
"paaq"	/'pá/	'broth, dal'
"baa"	/'bà/	'goiter'

"ta"	/'tɑ̀/	'now'
"da"	/'dɑ̀/	'arrow'
"taaq"	/'tá/	'sign, imprint'
"tsuq"	/'cʊ̀/	'plant (it)!'
"dzu"	/'jʊ̀/	'body'
"'tsaq"	/"cɑ́/	'grass'
"dza"	/'jɑ̀/	'rainbow
"tsiq"	/'cí/	'an accounting'
"dzi"	/'jì/	'necklace piece'
"cucuq"	/'čúču/	'elder brother'
"ju"	/'ǰʊ̀/	'please sit down'
"ciq"	/'čí/	'insert (it)'
"ji"	/'ǰì/	'four'
"'co"	/"čɔ̀/	'lama gown'
"jo"	/'ǰɔ̀/	'udder'
"Ti"	/'ṭì/	'ask (him)'
"Di"	/'ḍì/	'let's go!'
"Tu"	/'ṭʊ̀/	'dig!'
"Du"	/'ḍʊ̀/	'grain'
"kaaq"	/'ká/	'stick'
"gaa"	/'gà/	'happiness, pride'
"koq"	/'kó/	'dig!'
"go"	/'gò/	'head'
"ki-wi"	/'kì-wi/	'do' (Pres/Fut)
"'gi-wi"	/"gì-wi/	'come' (Pres/Fut)

2. Variation

Stops and affricates may be divided into three sets according to the environments that effect variation from the norm. For non-velar voiced stops and affricates and for retroflexed stops, only the norm, or free fluctuation in all environments has been noted. One exception to this is that following nasal consonants, /ǰ/ is manifested only as [ž], not as [dž].

/b/	1. [b]
/d/	2. [ḓ]
/j/	3. [dz / z]
/ǰ/	4. [dž / ž] (Following nasal consonants: [ž])
/ṭ/	5. [ṭ]
/ḍ/	6. [ḍ]

For non-velar voiceless stops, the position within the word or phrase and the rate of speech have been seen to condition variation. Fricatives other than the aspirate /h/ also fit in this set. Five environments, the first of which represents the distribution of the "norm" are seen as important to the description of variation in this set.

"norm": Word-initial and word-medial in slow speech.

a. Intervocalic in rapid speech

b. Word-final

c. Following /ṭ/ within a word

d. In a word with an aspirated stop

	"norm"	a	b	c	d
/p/	7.[p]	8.[p̡]	9.[p̚]		10.[ᵽ]
/t/	11.[ṱ]	12.[ṱ]	13.[ṱ$^{\theta}$]	14.[ṭ/ṱ]	
/c/	15.[ts]	16.[t̡s]			
/č/	17.[tš]	18.[t̡š]			
/s/	19.[s]	20.[s̡]			
/š/	21.[š]	22.[š̡]			

For the velar stops and the aspirate /h/, the adjacent vowel qualities are relevant to the specification of environments inducing variation, in addition to certain of the environments listed above, which are also relevant.

"norm": Word-initial before central and back vowels, /u, o, ɔ, ɑ, a/.

a. Word-initial before front vowels, /i, e, æ/.

b. Word-finally after /u/ and /ɑ/.

c. Word-finally after front vowels, /i, e, æ/.

d. Word-finally after /o/.

e. Intervocalically.

Note that the lenis articulation conditioned by intervocallic position intersects with word-medial environments parallel to (b), (c), and (d) yielding fronted and backed variants of the lenis allophone.

	"norm"	a	b	c	d	e
/k/	23.[k]	24.[k̭]	25.[k˺/kʰ]	26.[k̭˺/k̭ʰ]	27.[ḳ˺/ḳʰ/	28.[k̬]
/g/	29.[g]	30.[g̭]				

In environment (e) number (28) one may also list the lenis back velar [ḳ] for intervocalic environments parallel to (d) and the lenis front velar [k̭] for intervocalic environments parallel to (c).

The aspirate /h/ assimilates to the position of the following vocoid. The variants of /h/ are phonetically transcribed as raised and underlined lower case vowel symbols. Examples of these are listed under (31) below.

The numbers associated with the variants in the charts above refer to the following numbered examples:

1. [b] voiced bilabial stop

/'bà/	[ba·]	'goiter'
/'bòmbu/	[bombu]	'big'

2. [d] voiced dental stop

/'d-ì/	[ḓi·]	'this one'
/"bìndu/	[biṋḓu]	'give' (Interrogative)

3.[dz/z] voiced alveolar stop with sibilant release alternating freely with voiced alveolar sibilant except that following nasal consonants only the sibilant occurs.

/'jèmu/	[dzemu/zemu]	'beautiful'
/'pèjα/	[pedzα/pezα]	'offspring'
/"pʌ́nja/	[pʌnza]	'a law'

4.[dž/ž] voiced alveo-palatal stop with sibilant release alternating freely with voiced alveo-palatal sibilant.

/'ǰù/	[džu·/žu·]	'please sit down'
/mὰǰα/	[mαdžα/mαžα]	'clothes'

5. [ṭ] voiceless retroflex stop

/"ṭhʌ́k/	[ṭΔ̱ʌḳ˺]	'blood'
/'gòṭa/	[gʷɔṭα]	'laughter'

6. [ḍ] voiced retroflex stop

/'ḍì/	[ḍi·]	'let's go'

7. [p] voiceless bilabial stop

/"pú/	[pu·]	'body hair'

8. [p̦] lenis bilabial stop

/"lhấp "ìn-si/	[ɨᵃ̱ap̦ɪŋs̭̦i·]	'if (they) read (it)'

9. [p˺] voiceless bilabial unreleased stop

/'pốp/	[pop˺]	'strike (him)'

10. [ᵽ] voiceless bilabial fricative

/"khαp/	[kΔ̱ʌᵽ/kΔ̱ʌp˺]	'needle'

11. [ṱ] voiceless dental stop

/"t-ì/	[ṱi·]	'that one'

12. [ṱ̦] lenis dental stop

/"kìtap/	[k̭iṱ̦a·p]	'book'

13. [t^{θ}]	voiceless inter-dental stop with fricative release		
	/'pét/	[pet^{θ}]	'open (it)'
14. [ṭ]	voiceless alveolar retroflexed stop		
	/'ṭìtu/	[ṭiṭu/ṭiṭṷ]	'ask' (Interrogative)
15. [ts]	voiceless alveolar stop with sibilant release		
	/"cά́/	[tsʌ·]	'grass'
16. [$\underset{ʒ}{t}$s]	voiceless alveo-palatal stop with sibilant release		
	/'mò-co-wi/	[mo$\underset{ʒ}{t}$so͜i]	'cook' (Neg. Pres/ Fut)
17. [tš]	voiceless alveo-palatal stop with sibilant release		
	/"čὰ/	[tšα]	'hen, fowl'
18. [$\underset{ʒ}{t}$s]	lenis alveo-palatal stop with sibilant release		
	/'čάčαη/	[tše>$\underset{ʒ}{t}$šʌη]	'mother's brother'
19. [s]	voiceless alveolar sibilant		
	/"sὰ/	[sʌ·]	'tooth'
	/'dàsa/	[ḓa·sa]	'room'
20. [$\underset{ʒ}{s}$]	lenis alveolar sibilant		
	/"šùsuη/	[šʊ$\underset{ʒ}{s}$ũ·]	'he has just begun'
21. [š]	voiceless alveo-palatal sibilant		
	/"šά́/	[šʌ·]	'meat'
22. [$\underset{ʒ}{š}$]	lenis alveo-palatal sibilant		
	/'khàša/	[$k^{\underline{a}}$a·$\underset{ʒ}{š}$a]	'stag'
23. [k]	voiceless velar stop		
	/"khά́/	[$k^{\underline{\Lambda}}$ʌ·]	'mouth'
	/'kú/	[ku·]	'steal (it)'
24. [k̭]	voiceless front velar stop		
	/"kí/	[k̭i·]	'dog'

/'késuŋ/	[k̭esʊŋ]	'(she) has just given birth'

25.[k˺/kʰ] voiceless unreleased velar stop in free variation with voiceless velar stop with aspirate release

/"yák/	[yʌk˺/yʌkʰ]	'yak'

26.[k̭˺/k̭ʰ] voiceless unreleased front velar stop in free variation with voiceless front velar stop with aspirated release

/"jìk/	[dzik̭˺/dzik̭ʰ]	'tiger'

27.[ḳ˺/ḳʰ] voiceless unreleased back velar stop in free variation with voiceless back velar stop with aspirate release

/"nòk/	[ṋɔḳ˺/ṋɔḳʰ]	'was'

28.[$\underset{ʒ}{\text{k}}$], [$\underset{\hat{ʒ}}{\text{k}}$], [$\underset{\dot{ʒ}}{\text{k}}$] lenis velar stops

/'làka/	[la·$\underset{ʒ}{\text{k}}$a]	'work'
/'ìki/	[i·$\underset{\hat{ʒ}}{\text{k}}$i]	'literature'
/"wɔ̀kla/	[wɔ$\underset{\dot{ʒ}}{\text{k}}$la]	'under'

29. [g] voiced velar stop

/'gò/	[go·]	'head'

30. [g̭] voiced fronted velar stop

/"gyùk/	[g̭ʸuk˺]	'go!'

31. /h/ assimilates to the position of the following vocoid. Consider the following examples:

/"khí/	[k̭$^{\underline{i}}$i·]	'you' (Pl)
/"phé/	[p$^{\underline{e}}$e·]	'bite!'
/"khá/	[k$^{\underline{ʌ}}$ʌ·]	'mouth'
/"lhó/	[ɨ$^{\underline{o}}$o·]	'look!'
/"thú/	[ṱ$^{\underline{u}}$u·]	'pick!'
/'rhyú/	[ṣ̌$^{\underline{ü}}$u·]	'monkey'

/"phì ŋ/	[p^{ɿ}ɩŋ]	'noodles'
/'lhyáe/	[ɫ$^{\underline{ε}}$ę^{ə}·]	'navel'
/'khá/	[k^{ə}a·]	'snow'
/'khɔ́-ni/	[k$^{\underline{ɒ}}$ɒ·ni]	'having brought'
/"hù1/	[$^{\underline{u}}$ul^{w}]	'flock'
/'hànga/	[a̤·ŋga/^{ə}a̤·ŋga]	'branch'

B. Sonants in Sherpa

1. Contrast

Sherpa may be described as having the following system of sonants. The characters used are those of the phonemic transcription. Text orthography differs from the phonemic transcription in that /ŋ/ = "ng".

m ——— n ——— ŋ

l ——— r

w ——— y

Choosing this system of obstruants entails choosing the following system of clusters in which obstruants occur in syllable-initial position.

ŋy

lh rh

ly ry

lhy rhy

Examples of these clusters are to be found in the section on the distribution of consonants.

Evidence for contrast in the system of sonants may be found in examples like the following.

"'mi"	/"mì/	'man'
"'ngyiq"	/"ŋyí/	'two'

"'me"	/mè/	'fire'
"ngye"	/'ŋyè/	'my'
"maq"	/'mɑ́/	'a wound'
"'naa"	/"nà/	'a kind of wheat'
"'nae"	/"næ̀ /	'a place of pilgrimage'
"ngyaaq"	/'ŋyá/	'borrow it!'
"ra"	/'rɑ̀/	'goat'
"'la"	/"lɑ̀/	'hill'
"ro"	/'rò/	'corpse'
"lo"	/'lò/	'year'
"'wao-wu"	/"wɔ̀-wu/	'come' (Interrogative'
"'yum"	/"yùm/	'mother' (Honorific)
"'waa"	/"wà/	'is'
"yae"	/"yæ̀ /	'third year of the Tibetan cycle'
"'yakq"	/"yɑ́k/	'yak'
"'waok"	/"wɔ̀k/	'under'
"'waotu"	/"wɔ̀tu/	'be' (Interrogative)

2. Variation

There appears to be relatively little grouping of variants according to conditioning environments. Not even the nasal consonants share conditioning environments. For nasal consonants, the following environments have relevance:

a. In syllables with affricates

b. Following retroflexed stops

c. Following front vowels

d. Before front vowels

e. Syllable-final in rapid speech

	"norm"	a	b	c	d	e
/m/	1. [m]					
/n/	2. [ṋ]	3. [n]	4. [ṇ]			
/η/	5. [η]			6. [η̭]	7. [n̂]	8. [ṽ]

The numbers in this chart refer to the examples that follow.

1. [m] voiced bilabial nasal

/"mά/	[mʌ·]	'a sore;
/'sérmu/	[seřmu]	'fingernail'

2. [ṋ] voiced dental nasal

/'nά/	[ṋʌ·]	'day after tomorrow'
/'nǽ nbu/	[ṋεṋbu]	'sharp'

3. [n] voiced alveolar nasal

/"pάnja /	[pʌnza]	'claw'
/"ǰæ̀ nbi/	[džεnbi]	'flour'

4. [ṇ] voiced alveolar retroflexed nasal

/"ṭì-ni/	[ṭìṇi]	'having asked'

5. [η] voiced velar nasal

/'ηὰ/	[ηα]	'I'
/'nάη/	[ṋʌη]	'give (it)!'

6. [η̭] voiced front nasal

/'šìη/	[šιη̭]	'field'

7. [n̂] voiced alveopalatal nasal

/"ηyé/	[n̂e·]	'let's count'
/"ηyí/	[n̂i·]	'two'

8. [ṽ] nasalization of preceding vocoid

/"šùsuη/	[šusũ]	'he has just begun'

For liquids, the following environments are relevant in accounting for the observed variants:

a. Word-initial before /h/. (The same variant of /r/ that occurs here also occurs syllable-finally in syllables beginning with /š/.)
b. Word-initial before /y/.
c. Word-initial before /hy/.
d. Word-medial before voiceless obstruants.
e. Word-medial before syllable-final nasal.
f. Imperative sentence-final.
g. Following back vocoids.
h. Before the sequence: /h/ followed by a back vowel.
i. Following /r/ or /ṭ/ within a closed syllable.

	"norm"	a	b	c	d
/r/	9.[ř/ɍ/ř̲]	10.[ɍ̲]	11.[ẓ̌]	12.[ṣ̌]	13.[ř̲]
/l/	16.[l]	17.[ƚ]	18.[l̂]	19.[ƚ̂]	

	e	f	g	h	i
/r/	14.[ə̣]	15.[ř̲/ɍ/r̲̂]			
/l/			20.[$\overset{w}{l}$]	21.[$\overset{w}{ƚ}$]	22.[ḷ]

Regarding the "norm" for /r/ it should be noted that [ř] and [ɍ] fluctuate freely with one another in initial position and that [ř̲] and [ř] fluctuate freely with one another in final position. The numbers in this chart refer to the examples that follow.

9.[ř / ɍ / ř̲] voiced alveolar retroflexed flap in free fluctuation with a voiced alveolar retroflexed fricative in initial position and wi with a voiceless alveolar retroflexed flap in final position.

/ 'rì/	[ři / ɍi]	'hill, mountain'
/'màr/	[mɑ·ř / mɑ·ř̲]	'butter'

10. [ɍ̲] voiceless alveolar retroflexed fricative

/"rhá/	[ɍ̲$^{\underline{\Delta}}$ʌ·]	'hair'
/"šór/	[šʊɍ̲]	'rice'

11. [ẓ̌]	voiced alveopalatal retroflexed fricative		
	/"ryù/	[ẓ̌ʷ̈u·]	'puppy'
12. [ṣ̌]	voiceless alveopalatal retroflexed fricative		
	/"rhyú/	[ṣ̌ʷ̱̈u·]	'monkey'
13. [ř̲]	voiceless alveolar retroflex flap		
	/"ɑ́rkyok/	[?ɑř̲k̭ʸɔḳ]	'horn, antler'
14. [ə̣]	voiced central retroflex vocoid		
	/"thèrmbu/	[ṱᵉ̱eə̣mbu]	'tall'
15.[r̲̂ / ɍ / ř̲]	voiceless avleolar trill in free fluctuation with a voiceless alveolar retroflex fricative and a voiceless alveolar retroflex flap.		
	/"tír/	[ṱɩr̲̂ / ṱɩɍ / ṱɩř̲]	'flip (it)!'
16. [l]	voiced alveolar lateral		
	/"lɑ̀/	[la·]	'hill'
	/"khél/	[k̭ᵉ̱el]	'appoint (him)!'
17. [ƚ]	voiceless alveolar lateral		
	/"lháp/	[ƚ-a·p˺]	'looking'
18. [l̂]	voiced alveopalatal lateral		
	/'lyæ̀mu/	[l̂æ·mu]	'good'
19. [ƚ̂]	voiceless alveopalatal lateral		
	/'lhyǽ/	[ƚ̂ᵋɛ̢ᵊ]	'navel'
20. [$\overset{w}{l}$]	voiced alveolar labialized lateral		
	/"lú/	[$\overset{w}{l}$u·]	'song'
	/'ɳúl/	[ɳu$\overset{w}{l}$]	'silver'
21. [ḷ]	voiced alveolar retroflexed lateral		
	/"rúl/	[ɍuḷ]	'snake'
	/"ṭhìl/	[ṭᶥ˃ɩ˃ḷ]	'wrap (it)!'

For glides, the following environments are relevant in accounting for the observed variants:

a. After /h/ and before /u/ and /o/
b. Elsewhere after /h/
c. Word-initial before /u/ and /o/
d. Intervocalic, adjacent to /i/

	"norm"	a	b	c	d
/y/	22. [y]	23. [Ẅ]	24. [Y]	25. [ẅ]	26. [i]
/w/	27. [w]				

The numbers in this chart refer to the examples that follow.

22. [y] voiced high front unrounded glide

/"yàku/	[yaku]	'brother-in-law'
/'kyæ̀-ni/	[k̭ʸæ·ṋi]	'having done'

23. [Ẅ] voiceless high front rounded glide

/"ǽrkyok/	[?αr̠k̭$^{\ddot{W}}$ɔḳᵀ]	'horn'

24. [Y] voiceless high front unrounded glide

/"khyǽ-ni/	[k̭^{Y}æ·ṋi]	'having frozen'

25. [ẅ] voiced high front rounded glide

/"yùl/	[ẅulʷ]	'village'

26. [i] voiced high front unrounded vocoid

/'péyi/	[pei̮·]	'(I) opened (it)'
/'kìyi/	[k̭i·]	'(I) did (it)'
/'kìyu/	[k̭iu / k̭ʸu·]	'did (you) do (it)?'

27. [w] voiced high back rounded glide

/"wɔ̀k/	[wɒḳᵀ]	'under'
/'kì-wi/	[k̭iwi]	'do' (Pres/Fut)

C. Distribution of Consonants in Sherpa

All consonants occur syllable initially. The segments /p/, /t/, /k/, /m/, /n/, /ŋ/, /r/ and /l/ also occur syllable finally. Syllable-initial clustering of consonants is limited to clustering with /h/ and /y/. Syllable-final clustering is limited to clustering with /r/.

The following syllable-initial clusters have been observed:

1. ph	2. th	3. ṭh	4. ch	5. čh	6. kh
7. py	8. ty		9. cy	10. čy	11. ky
					12. khy
	13. dy				14. gy
					15. ŋy
	16. sy			17. šy	
	18. ly	19. ry			
	20. lhy	21. rhy			

Only one syllable-final cluster has been observed: "-rm". It occurs in the following:

"'thermbu"	/"thèrmbu/	'tall'

The numbers in the chart above refer to the examples below.

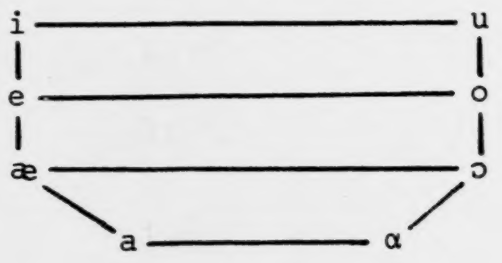
1.	"'phirq"	/"phír/	'jump!'
2.	"'thokq"	/"thók/	'thunder'
3.	"'Thil"	/"ṭhìl/	'wrap (it)!'
4.	"'tshikq"	/"chík/	'burn (it)!'
5.	"'chae"	/"čhæ̀/	'great man'
6.	"'khelq"	/"khél/	'appoint (him)!'
7.	"pyae"	/'pyæ̀/	'rat'
8.	"'ty-ae"	/"tyæ̀/	'there'

9.	"'tsyaepq"	/"cyǽp/	'playing'
10.	"cyaa"	/'čya/	'iron'
11.	"kyae-ni"	/'kyæ̀ni/	'having done'
12.	"'khyoq"	/"khyó/	'you' (Singular)
13.	"dy-ae"	/'dyæ̀/	'here'
14.	"gyaamu"	/'gyàmu/	'strong, husky'
15.	"ngyaaq"	/'ηyá/	'borrow (it)!'
16.	"syaa"	/"syà/	'mane'
17.	"'zyaapq-laa"	/"šyàp-la/	'for dying'
18.	"lyaemu"	/'lyæ̀mu/	'good'
19.	"'ryu"	/"ryù/	'puppy'
20.	"lhyaeq"	/'lhyǽ/	'navel'
21.	"'rhyuq"	/"rhyú/	'monkey'

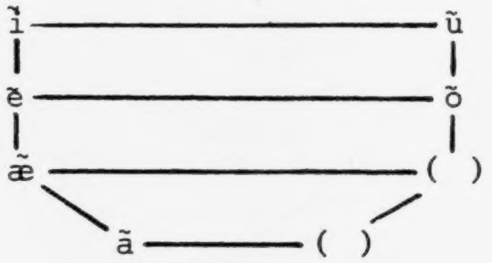
D. Vowels in Sherpa

1. Contrast

Sherpa may be described as having the following system of contrasting vowels:



All but two of these vowels have nasal counterparts:



The characters used above are those of the phonemic transcription. They differ from those used in text orthography as follows: /æ/ = "ae", /ɔ/ = "ao", /a/ = "aa", /ɑ/ = "a". Nasality of a vowel in text orthography is indicated by "N" following the vowel. Choosing this system of vowels entails no clustering of vowels within the syllable.

Evidence for contrast within the system of vowels may be seen in examples like the following:

"liq"	/'lí/	'to attract'
"li"	/'lì/	'to separate grain'
"le"	/'lè/	'year'
"laeq"	/'lǽ/	'life'
"laa"	/'là/	'month'
"'la"	/"lɑ̀/	'hill'
"lao"	/'lɔ̀/	'get up!'
"laoq"	/'lɔ́/	'take it!'
"lo"	/'lò/	'year'
"'luq"	/"lú/	'song'
"'mi"	/"mì/	'man'
"'me"	/"mè/	'fire'
"'mae"	/"mæ̀/	'no'
"maa-"	/ma-/	'not'

(Note that the negative prefix assimilates to the tone and intonational class of the stem to which it is affixed.)

"maq"	/'mɑ́/	'wound'

"moq"	/'mó/	'to plough'
"'siq"	/"sí/	'who'
"'seq"	/"sé/	'kill'
"syaeq"	/'syǽ/	'custom'
"saa"	/'sà/	'copper'
"'saq"	/"sɑ́/	'tooth'
"sao"	/'sɔ̀/	'eat!'
"soq"	/'só/	'tame'
"'suq"	/"sú/	'who'
"ki"	/'kì/	'let's do'
"keq"	/'ké/	'let's dig'
"'kaeq"	/"kǽ/	'where is ?'
"kaaq"	/'ká/	'stick'
"'kaoq"	/"kɔ́/	'break it!'
"koq"	/'kó/	'dig!'
"kuq"	/'kú/	'thief'
"'simq"	/"sím/	'hemp'
"semq"	/'sem/	'heart'
"samq"	/'sám/	'a kind of bark'
"somq"	/'sóm/	'partner'
"sumq"	/'súm/	'three'

2. Variation

There are two kinds of environments responsible for the deviation of vowels from the phonetic norm: 1) environments productive of parallel variation across phonemes and 2) environments in which only a few or perhaps only one phoneme manifests deviation from the norm. Except for (C) and (A) the following environments produce parallel variants in most vowels.

- I. Length Variants
  - A. Phrase Final: two extra moras of length.
  - B. Monosyllabic Word Final: one extra mora.
  - C. Before /-yi/: shortened.
- II. Tense-Lax Variants (Tense is norm)
  - D. In Tone-2 (low tone) words: lax variants.
- III. Nasalization
  - E. Before phonemic nasal vowels, a vowel is nasalized.

Except for (L), each of the following environments produces deviation from the norm in only a few vowels.

- IV. Centralization
  - F. Following retroflex consonants and in the environment /č___č/.
  - G. Interconsonantal before bilabials.
- V. Pre-Glide
  - H. Following velar consonants and bilabial consonants in open monosyllabic words.
  - I. Following velars and bilabials, word medially.
- VI. Miscellaneous
  - J. Following /w/ in an open syllable where the following syllable is not /yi/.
  - K. Following /w/ in a closed syllable.
  - L. The vowel of a stressed syllable in a disyllabic word may be lengthened, especially in rapid speech.

	"norm"	A	B	C	D	E	L
/i/	1.[i]	2.[i:]	3.[i·]		4.[į]	5.[ĩ]	47.[i·]
/e/	6.[e]		8.[e·]		9.[ę]	10.[ẽ]	
/æ/	11.[æ]		12.[æ·]		13*.[ɛ?]	14.[æ̃]	
/a/	15.[a]	16.[a:]	17.[a·]	18.[ɛ̆˘/æ̆ ă]	19*.[æ?]	20.[ã]	48.[a·]
/ɑ/	21.[ʌ]		22.[ʌ·]	23.[ə̆]	24.[ɑ]		
/ɔ/	26.[ɒ]		27.[ɒ·]				49.[ɒ·]
/o/	28.[o]	29.[o:]	30.[o·]		31.[ǫ]	32.[õ]	
/u/	33.[u]	34.[u:]	35.[u·]		36.[ų]	37.[ũ]	50.[u·]

*Word-final in monosyllabic words with Intonation 1.

	F	G	H	I	J	K
/i/	38.[ɩ˃]					
/e/	39.[e˃]		40.[ʸe/e]	41.[ʸɛ/ɛ]		
/ɑ/		42.[ɔ˃/ʌ]				
/ɔ/					43.[ɒ·]	44.[ɔ·]
/o/			45.[ʷo/o]	46.[ʷɔ/ɔ]		

The numbers in the charts above refer to the following examples.

1. [i] voiced high front unrounded vocoid

/"kí 'ṭèŋ/ [k̭i ţɛŋ] 'dogs'

2. [i:] voiced high front unrounded vocoid with two extra morae of length

/'lά́p-ki-wi/ [lʌpkɩwi:]// 'look' (// = phrase boundary)

3. [i·] voiced high front unrounded vocoid with one extra mora of length

/"t-i/ //[ṱi·] 'that'

4. [į] voiced lax high front unrounded vocoid

/"mæ̀ŋ-gi-wi/ [mæŋg̭ʸwį] '(he) won't come'

5. [ĩ] voiced high front unrounded nasalized vocoid

/'ṭìkĩ/ [ṭĩ˃k̭ĩ] 'writing'

6. [e] voiced mid close front unrounded vocoid

/'pét/ [pe^ṱ] 'open (it)'

8. [e·] voiced mid close front unrounded vocoid with one extra mora of length

/'lé/ [le^·] 'year'

9. [ę] voiced lax mid close front unrounded vocoid

/'pèdzɑ/ [pędzɑ] 'offspring'

10. [ẽ] voiced mid close front unrounded nasalized vocoid

/"céyĩ/ [ts̆ẽyĩ] '(I am) playing'

11. [æ] voiced low close front unrounded vocoid

/"ŋǽkyok/ [ŋæk̭ʸɔ k] 'pot, vessel'

12. [æ·] voiced low close front unrounded vocoid with one
extra mora of length

/'kyæ̀ / [k̭ʸ æ·] 'do' (Past)

13. [ɛˀ] voiced mid open front unrounded vocoid shortened
with glottal catch

/mæ̀ / [mɛˀ] 'no'

14. [æ̃] voiced low close front unrounded nasalized vocoid

/'cyǽyĩ/ [tsʸ æ̃ĩ] 'cutting'

15. [a] voiced low open front unrounded vocoid

/'káŋ/ [kaŋ] 'marrow'

16. [a:] voiced low open front unrounded vocoid with two
morae of extra length

/'gà̆l-sima/ [gɑlsɩma:]// 'having gone'

17. [a·] voiced low open front unrounded vocoid with one
mora of extra length

/'ná/ [ṋa·] 'day after tomorrow'

18.[ɛ̆˘/æ̆ / ă/] voiced shortened mid open front unrounded
vocoid in fluctuation with a voiced shortened front
low close front unrounded vocoid and with a voiced
shortened low open front unrounded vocoid

/'sàyi/ [sɛ̆˘ɩ/sæ̆ i·/săi] '(I am) eating'

19. [æˀ] voiced low close front unrounded vocoid shortened
with glottal catch

/"wà/ [wæˀ] 'is'

20. [ã] voiced low open front unrounded nasalized vocoid

/'lháyĩ/ [ɬᵃãĩ·] 'looking'

21. [ʌ] voiced mid open central unrounded vocoid

/"tɑ́k/ [t̪ʌḳᵀ] 'lion'

22. [ʌ·] voiced mid open central unrounded vocoid with one extra mora of length

/"khɑ́/ [k^Δʌ·] 'mouth'

23. [ə̆] voiced mid close central shortened unrounded vocoid

/'tɑ́yi/ [tə̆͜i·] 'spoon'

24. [ɑ] voiced low central unrounded vocoid

/mɑ̀jɑ/ [mɑžɑ] 'clothes'

26. [ɒ] voiced low open back rounded vocoid

/'lɔ́wɑ/ [lɒwɑ] 'servant'

27. [ɒ·] voiced low open back rounded vocoid with one extra mora of length

/'lɔ́/ [lɒ·] 'take (it)!'

28. [o] voiced mid close back rounded vocoid

/"tóŋ-gu-wi/ [t̪oŋgui] 'provide'

29. [o:] voiced mid close back rounded vocoid with two extra morae of length

/'thó/ [t̪ᵒo:]// 'able'

30. [o·] voiced mid close back rounded vocoid with one extra mora of length

/'pó/ [po·] 'incense'

31. [o̢] voiced lax mid close back rounded vocoid

/"mòlɑ/ [mo̢lɒ] 'just now'

32. [õ] voiced mid close back rounded nasalized vocoid

/tóŋi/ [t̪õŋĩ·] 'leave'

33. [u] voiced high close back rounded vocoid

/'cówu/ [tso͜uˆ] 'did you cook?'

34. [u:] voiced high close back rounded vocoid with two extra morae of length

/'čhèrmu/   [tš$^{\underline{e}}$eřmu:]//   'day'

35. [u·] voiced high close back rounded vocoid with one extra mora of length

/'ḍù/   [ḍu·]   'grain'

36. [u̢] voiced lax high close back rounded vocoid

/'kì-ru/   [k̭iřu̢]   'do'

37. [ũ] voiced high close back rounded nasalized vocoid

/"phúrǐ/   [p$^{\underline{u}}$ũɍǐ·]   'fly'

38. [ι>] voiced high open front-centralized unrounded vocoid

/"rìl-suη/   [ɍι>ḷsuη]   '(she) rolled (the dough)'

39. [e>] voiced mid close front-centralized unrounded vocoid

/'čáčαη/   [tše>tsʌη]   'mother's brother'

40. [^{y}e/e] voiced mid close front unrounded vocoid with fluctuating palatal on-glide

/'pé/   [p^{y}e·/pe·]   'open (it)!'

41. [^{y}ɛ/ɛ] voiced mid open front unrounded vocoid with fluctuating palatal on-glide.

/'gèk/   [g^{y}ɛk˺/gɛk˺]   'hit'

42. [ɔ>/ʌ] voiced low close back-dentralized rounded vocoid fluctuating with a voiced mid open central unrounded vocoid

/"láp/   [lɔ>p˺/lʌp˺]   'learn'

43. [ɒ·] voiced low open back rounded vocoid with one extra mora of length

/'khɔ-ni/   [k^{W}ɒ·ni/k$^{\underline{ɒ}}$ɒ·ni]   'having bought'

44. [ɔ·] voiced low close back rounded vocoid with one extra mora of length

/"kɔ́p/ [kʷɔ·p˺/kɔ·p˺] 'digging'

45. [ʷo/o] voiced mid close back rounded vocoid with fluctuating labial on-glide

/'kó/ [kʷo·/ko·] 'dig!'

46. [ʷɔ/ɔ] voiced low close back rounded vocoid with fluctuating labial on-glide.

/'gɔ̀ṭα/ [gʷɔṭα/gɔṭα] 'laughter

47. [i·] voiced high close front unrounded vocoid with one mora of extra length

/'ìki/ [i·k̭i] 'literature'

48. [a·] voiced low open front unrounded vocoid with one mora of extra length

/'dàsa/ [ḓa·sa] 'room'

49. [ɒ·] voiced low open back unrounded vocoid with one extra mora of length

/'khɔ́-ni/ [kᶛɒ·ni] 'having bought'

50. [u·] voiced high close back rounded vocoid with one extra mora of length

/"s̆ŭsuŋ/ [sʊsũ·] 'he has just begun'

(The Nasalization in example (50) is a realization of /ŋ/, hence is not included in the description of the conditioned variant of /u/ exemplified here.)

3. Distribution

There is no clustering of vowels within the syllable.

A NOTE ON SHERPA VOWELS

Burkhard Schoettelndreyer

and Austin Hale

[The Sherpa vowel system has a relatively complex set of rules for specifying the phonetic manifestation of phonemes. During the research period covered by this report, three analyses have been proposed. The first is that of Kent Gordon. The materials found in Gordon, 'Sherpa Tone and Higher Levels', elsewhere in this volume, are transcribed in terms of this analysis. A detailed account of this analysis is to be found in Gordon (1969). The second analysis represents a somewhat tentative revision of Gordon's analysis by Schoettelndreyer. 'Sherpa Word List' and 'Sherpa Texts' to be found elsewhere in this report are transcribed in terms of this second analysis, and statement of the analysis is to be found in Gordon and Schoettelndreyer, 'Sherpa Phonemic Synopsis', above. Gordon has objected to the treatment of vowels given in this second analysis, and his objections have stimulated Schoettelndreyer to arrive at a third analysis which has certain decided advantages over both of the previous analyses. Unfortunately, this third analysis was completed only after the text materials had gone to press, thus making it impossible to substitute this latest analysis for the tentative analysis that it now replaces. The purpose of this note is to explore these three alternatives briefly, and to provide a sketch of the most recent view of Sherpa vowels now available to us.]

The first of the three analyses to be discussed here is that arrived at by Kent Gordon during the Summer of 1969. The major features of Gordon's analysis arose at least in part out of discussions with Hale regarding the phonological structure of Newari.

It will be recalled that /ə/ in Newari is fronted and raised to [e] or [ɛ] after /i/ and that it is backed and raised to [o] or [ɔ] after /u/. Seeing a similar pattern in Sherpa, Gordon proposed a vocalic system which included two co-vowels, /y, w/ and six vowels:

i			u
e			o
	a	ɑ	

In this system, the two low vowels were assimilating vowels

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with fronted variants following the co-vowel /y/ and with backed variants following the co-vowel /w/. The low front vowel /a/ was inherently longer than the low back vowel /ɑ/, and in certain environments, length and not vowel quality was the phonetic feature distinguishing the two.

When Gordon left Kathmandu, Schoettelndreyer took over responsibilities for research in Sherpa. Over a period of time various difficulties appeared which led Schoettelndreyer to explore other possibilities. The most important of these difficulties concerned the co-vowels. In some cases, for example, /y/ fronted the following vowel and then disappeared without palatalizing the preceding consonant.

/"myɑ̀/	[mɛˀ]	'no'
/"wyà/	[wæˀ]	'is'

In most cases /y/ effected both palatalization and vowel fronting.

/"kyápla/	[k̭ʸæ:pla]	'for giving birth'
/"tyà/	[ṱʸæ·]	'there'
/'lyàmu/	[l̂æ·mu]	'good'
/"lyàsuη/	[l̂æ·suη]	'it was productive'
/"khyáni/	[k̭ʸæ·n̥i]	'having frozen'
/"gyɑ̀p/	[gyɛ>p']	'back'

But in some cases, /y/ appears to effect palatalization without fronting of low vowels.

/'gyàmu/	[gʸa·mu]	'strong'
/'gyàsuη/	[gʸa·suη]	'(it) was just flooded'

In still another case, palatalization is not traced to /y/ at all.

/"gèk/	[g͓ʸek']	'hit (him)'

When /y/ patterns as a consonant, it appears to front low vowels, but the resultant vowel quality is strongly influenced by tone: (or by syllable closure?)

/"yɑ́k/	[yɛ>k']	'yak'
/"yɑ̀ku/	[yaku]	'brother-in-law'

In most cases /w/ both labializes the preceding consonant and backs a following low vowel.

/"ḍwàp/	[ḍʷɔ·p˺]	'to go'
/'lwá/	[lᷱɔᵊ·]	'liver'
/"kwáp/	[kʷɔ·p˺]	'digging'
/'khwáni/	[k-ʷɒni]	'having brought'
/'lhwá/	[ƚ-ʷɔ̲ɔᵊ·]	'hunger'

In a few cases /w/ backs a low vowel but does not labialize the preceding consonant.

/'swɑ̀/	[sɒ]	'eat'
/'lwɑ́/	[lɒ]	'take it!'
/'lhwɑ́/	[ƚ-ɒ̲ɒ]	'weave'

As a consonant, /w/ backs a low vowel, sometimes rounding a preceding consonant as well.

/"wàtu/	[wɒṱu]	'is?'
/'lɑ́wa/	[lᷱɒwɑ]	'servant'

Length of low vowels is in general easy to determine from the phonemic transcription, the variants of /a/ being long and those of /ɑ/ being short. The following, however, is an exception to this:

/"wyà/	[wæʔ]	'is'

On this analysis, sets such as the following are not easily readable.

/'ŋyá/	[n̂a·]	'yoke'
/'ŋyá/	[n̂ɛ·]	'borrow it!'
/"ŋyà/	[n̂a·]	'joke'
/'gyàmu/	[gʸa·mu]	'strong'
/'kyàni/	[k̭ʸæ·ṋi]	'having done'
/"gyɑ̀p/	[g̭ʸɛ˃p˺]	'back side'
/'gyɑ̀/	[g̭ʸɛʔ]	'eight'

Considerations such as these led Schoettelndreyer to revise Gordon's analysis, tentatively eliminating co-vowels and adding two low vowels, /æ / and /ɒ/. This move led to the system presented in the 'Sherpa Phonemic Synopsis' given below. The primary advantage of this revision was that it rendered palatalization and labialization of consonants easily readable from the phonemic transcription.

In anticipation of such a move, Gordon had written his objections to it in his Phonemic Summary (1969:38,39).

> "A second alternative would be to set up an eight-vowel system with */æ / and */ɔ/ in addition to the six proposed here. This would do away with co-vowel clusters as in [wæ ʔ] /"wyà/ 'is' and [n̂ɔ·pla] /"ŋywàpla/ 'to buy'. These would be phonemicized as */"wæ̀ / and */"ŋyɔpla/ respectively in an eight-vowel system.
>
> "This solution would be difficult to sustain for the following reasons:
>
> a. An imbalance would be created in that /a/ would never occur following /y/, though */æ / frequently would. That /y/ should co-occur with */æ / and /ɑ/ but not with /a/ would be unaccountable.
>
> b. A further imbalance would be created in that /w/ would co-occur with two of the low vowels but inexplicably fail to occur with the remaining two low vowels in an eight-vowel system.
>
> c. The length of [ɔ·] in [n̂ɔ·pla] is left unexplained, particularly since [sɒ], interpreted as /sɔ̀/ in an eight-vowel system, is too short by contrast. The reverse should obtain: [sɒ] should be longer than [n̂ɔ·p˺] even allowing for the imperative intonation of [sɒ].
>
> d. In terms of economy, the eight-vowel system adds two phonemes but does not subtract /y/ or /w/. The six-vowel system subtracts two phonemes from the inventory and adequately accounts for all contrasts occurring at the syllable nucleus."

The re-iteration and amplification of these objections in a letter prompted Schoettelndreyer to seek a third alternative. On checking through the material with informants, certain differences in hearing between Gordon and Schoettelndreyer emerged, and certain facts about vowel harmony became clear which led to the six-vowel system without co-vowels described below.

The move from an eight-vowel system without co-vowels to a six-vowel system without co-vowels may in general be characterized as re-assignment of the variants of /æ/ and /ɒ/ to /e/ and /o/ respectively with the exception of [ɒ] which is re-assigned to /ɑ/. The resultant system has the following advantages over the earlier systems.

1. The elimination of partial overlap.

a. Partial overlap of /ya/ and /e/ in [æ]:

/"wyà/	[wæʔ]	'is'
/"mèŋgiwi/	[mæŋg^{y}wi]	'(he) won't come'

Schoettelndreyer hears the second of these two differently from Gordon. The new analysis has:

/"wè/	[wæʔ]	'is'
/"mèŋgiwi/	[mɛ̆ŋg^{l}wi]	'(he) won't come'

On the previous analysis, the [æ] in [wæʔ] should have been long. On this analysis, there is no anomaly in the shortness of [æ] here, since it is no longer assigned to the inherently long vowel /a/.

b. Partial overlap of /a/ and /ɑ/ in [a]:

/'sàyi/	[sai]	'(I am) eating'
/'ŋyɑ/	[n̂a]	'fish'

Both analyses agree that in certain cases /-yi/ conditions shortness in a preceding vowel, but Schoettelndreyer hears the second of these two differently:

/'ŋyɑ̀/	[n̂ɑ]	'fish'

c. Partial overlap of /ŋ/ and /ŋy/ in [n̂]:

/'ŋyá/	[n̂ɛ·]	'borrow (it)'
/"ŋywáp/	[n̂ɔ·p']	'mad'
/"ŋé/	[n̂e]	'let's count'
/"ŋí/	[n̂i]	'two'

The rule operative here is that /η/ is [n̑] before front vowels and [η] before back vowels. /ηy/ is [n̂] before back vowels. The following seems to be an exception:

/"ηékyok/	[ηæk̭ʸɔḳ˺]	'pot, vessel'

The more recent analysis assigns all instances of [n̂] to /ηy/ and views /ηy/ as a phoneme and could very well be written /n̂/. /η/ has only the allophone [η], and its closely related variants. Consequently, /η/ has a defective distribution in that it fails to occur before front vowels.

2. The elimination of unreadable pairs:

   a. /ya/ has two contrasting phonetic realizations in high tone open syllables on the old analysis:

/'ηyá/	[n̂a·]	'yoke'
/'ηyá/	[n̂ɛ·]	'borrow it!'

The latest analysis differs as follows:

/'ηyé/	[n̂ɛ·]	'borrow it!'

   b. /ya/ has two contrasting realizations in low tone open syllables on the old analysis:

/'gyàmu/	[gʸa.mu]	'strong'
/'kyàni/	[k̭ʸæ·ṋi]	'having done'

The new analysis differs from the old by having

/'kyèni/	[k̭ʸæ·ṋi]	'having done'

   c. /yα/ has two realizations in low tone syllables that are apparently not explained by the difference between closed and open syllables.

/"gyὰp/	[g̭ʸɛ˃p˺]	'back side'
/"gyὰ/	[g̭ʸɛˀ]	'eight'

The new analysis differs in phonetic description as well as phonemic interpretation at this point:

/"gyὰp/	[gʸʌp˺]	'back side'
/"gè/	[g̭ʸɛˀ]/[g̭ɛˀ]	'eight'

3. A clearer picture of vowel harmony:

In statements the vowel of the negative prefix is copied from the first vowel of the stem. The new analysis has the following:

/'mì-ki-wi/	[mik̭iwi]	'(he) will not do'
/"mé-se-wi/	[mesewi]	'(he) will not kill'
/'mé-rhe/	[mer̲ᵋε·]	'(I) don't burn'
/"mó-ŋo/	[moŋo·]	'let's not count'
/'mù-cu/	[mutsu]	'(I) don't sow'

The use of co-vowels in the earlier analysis tends to obscure this relationship in certain cases:

/'mé-rhya/	[mer̲ᵋε·]	'(I) don't burn'
/'mé-ŋya/	[m̩en̂ε·]	'(I) don't borrow'

The following is a synopsis of the latest analysis of Sherpa vowels.

Vowels in Sherpa

1. Contrast

Sherpa may be described as having the following system of contrasting vowels:

i	u
e	o
a	ɑ

All vowels have nasal counterparts:

ĩ	ũ
ẽ	õ
ã	ɑ̃

The characters used above are those of the phonemic transcription. They differ from those used in text orthography as follows: /a/ = "aa", /ɑ/ = "a". Nasality of a vowel in text orthography is indicated by "N" following the vowel. Choosing this system of vowels entails no clustering of vowels within the syllable.

Evidence for contrast within the system of vowels may be seen in examples like the following:

"liq"	/'lí/	'to attract'
"li"	/'lì/	'to separate grain'
"le"	/'lè/	'year'
"laa"	/'là/	'month'
"'la"	/"lɑ̀/	'hill'
"lo"	/'lò/	'year'
"'luq"	/"lú/	'song'
"'mi"	/"mì/	'man'
"'me"	/"mè/	'fire'
"maa-"	/ma-/	'not'

(Note that the negative prefix assimilates to the tone and intonational class of the stem to which it is affixed.)

"maq"	/'mɑ́/	'wound'
"moq"	/'mó/	'to plough'
"'siq"	/"sí/	'who'
"'seq"	/"sé/	'kill'
"saa"	/'sà/	'copper'
"'saq"	/"sɑ́/	'tooth'
"soq"	/'só/	'tame'
"'suq"	/"sú/	'who'

"ki"	/'kì/	'let's do'
"keq"	/'ké/	'let's dig'
"kaaq"	/'ká/	'stick'
"'kaq"	/"kɑ́/	'break it!'
"koq"	/'kó/	'dig!'
"kuq"	/'kú/	'thief'
"'simq"	/"sím/	'hemp'
"semq"	/'sém/	'heart'
"'samq"	/"sɑ́m/	'bamboo-fence'
"saamq"	/'sám/	'a kind of bark'
"somq"	/'sóm/	'partner'
"sumq"	/'súm/	'three'

2. Variation

There are two kinds of environments responsible for the deviation of vowels from the phonetic norm: 1. environments productive of parallel variation across phonemes and 2. environments in which only a few or perhaps only one phoneme manifests deviation from the norm. Except for (A) and (C) the following environments produce parallel variants in most vowels.

I. Length Variants*

A. Phrase final: two extra morae of length.
B. Monosyllabic word final: one extra mora.
C. Before /yi/ and following /ow/ disyllabic stem final: shortened.

II. Tense-Lax Variants (Tense is norm)

D. In Tone 2 (low tone) words: lax variants

III. Nasalization

E. Before phonemic nasal vowels, a vowel is nasalized.

Each of the following environments produce deviation from the norm in only a few vowels.

IV. Centralization

F. Following retroflex consonants and in the environment /čh__/ tone 2.

V. Pre-Glide

G. Following velar consonants and bilabial consonants in open monosyllabic words.
H. Following velars and bilabials, word medially.

VI. Lowering (intersecting with length)

I. In imperative verbs tone 1, intonation 2 and after /ny, ŋy, rh/.
J. Before /wɑ/ in disyllabic verb stems suffixed by /-p/.
K. Before /wɑ/ in disyllabic nouns and verb stems not suffixed by /-p/.

VII. Miscellaneous

L. Following /y/, but not /ŋy/.
M. Before nasal consonants.
N. In open stressed syllables of disyllabic words tone 1, intonation 2.

VIII. Glottal Stop (optional)

O. Monosyllabic non-nouns of the form Consonant + /e/ with final stress or with high tone have an optional final glottal stop and a lowering of vowel quality to [æ] following /w/ and to [ɛ] elsewhere.

(So we have a part of speech distinction to explain the following pair:

/"mè/	[me·]	'fire'
/"mè/	[mɛʔ]	'there is not')

For one of three informants (AD) only in imperative monosyllabic verbs with high tone and/or final stress, we have consonant + /i/ or /e/.

/"pé/	[pe^ʔ]	'throw it out!'
/'pé/	[pe^ʔ]	'open it!'
/"pí/	[pi^ʔ]	'undress!'
/'cí/	[tsi^ʔ]	'put!'

	"norm"	A	B	C	D	E
/i/	1.[i]	2.[i:]	3.[i·]		4.[i̟]	5.[ì]
/e/	6.[e]	7.[e:]	8.[e·]		9.[e̟]	10.[ĕ]
/a/	11.[a]	12.[a:]	13.[a·]		14.[a̟]	15.[ă]
/α/	16.[ʌ]		17.[ʌ·]	18.[ə]	19.[α̟]	20.[ə̆]
/o/	21.[o]	22.[o:]	23.[o·]		24.[o̟]	25.[ŏ]
/u/	26.[u]	27.[u:]	28.[u·]		29.[u̟]	30.[ŭ]

	F	G	H
/i/	31.[ɩ$^{>}$]		
/e/	32.[ɛ$^{>}$]	33.[^{y}e·/e·]	34.[^{y}ɛ/ɛ]
/o/		35.[^{w}o·/o·]	36.[^{w}ɔ/ɔ]

	I	J	K	L	M	N	O
/e/	37.[ɛ·]			38.[æ·]	39.[ɛ/ɛˇ]		40.[eʔ] 41.[æʔ]
/o/		42.[ɔ·]	43.[ɒ·]				
/α/						44.[ɒ]	

The numbers in the charts above refer to the following examples:

1.	/"kí 'ṭèn/	[k̭i^ ṭɛ̟ˇn]	'dogs'
2.	/'lάp-ki-wi/	[lʌ^pkɩwi:]//	'look' (//=phrase boundary)

3.	/"t-ì/	[t͓i̟·]	'that'
4.	/'jì/	[dži̟·]	'four'
5.	/'ṭìkĩ/	[ṭĭ˃k̭ĭ]	'writing'
6.	/'pét/	[pe^t͓ᶿ]	'open (it)!'
7.	/'ŋyíŋne/	[n̂i^ŋṋe:]//	'Ngyingne'
8.	/'l-é/	[le·^]	'year'
9.	/'pèja/	[pe̟dza]	'offspring'
10.	/"céyĩ/	[tsẽ^yĭ]	'(I am) playing'
11.	/'káŋ/	[ka^ŋ]	'marrow'
12.	/'gɑ̂l-sima/	[gɑ̟lsıma:]//	'having gone'
13.	/'ná/	[ṋa·^]	'day after tomorrow'
14.	/'màr/	[ma̟ř]	'butter'
15.	/'lháyĩ/	[ɬᵃ̠ã^ĩ·]	'looking'
16.	/"tɑ́k/	[ṱʌ^ḳᵀ]	'lion'
17.	/"khɑ́/	[kᶺ̠ʌ·^]	'mouth'
18.	/'tɑ́yi/	[tə͜i·^]	'spoon, ladle'
19.	/'mɑ̀ja/	[mɑ̟ža]	'clothes'
20.	/"wɔ̀wɑ-yĩ/	[wɒᵊ̃·ĩ]	'coming'
21.	/"tóŋ-gu-wi/	[ṱo^ŋgui]	'provide'
22.	/'thó/	[ṱᵒ̠o:^]//	'able'
23.	/'pó/	[po·^]	'incense'
24.	/"mòlok/	[mo̟lɔḳᵀ]	'just now'
25.	/'tóŋyĩ/	[ṱõn̂ĭ·]	'leave'
26.	/'cówu/	[tso͜u^]	'did (you) cook?'
27.	/'tshèrmu/	[tsᵉ̠e̟řmu:]//	'day'
28.	/'ḍù/	[ḍu̟·]	'grain'
29.	/'pùri/	[pu̟ŕi]	'cucumber'

30.	/"phűrĩ/	[pᵘ̲ũɍĩ·]	'fly'
31.	/"rȉl-suɳ/	[ɍɩ>ḷsuɳ]	'(she) rolled (the dough)'
32.	/"čhè/	[tš̽ᵋ̲ɛ≥̣]	'great man'
33.	/'pé/	[pye·^ / pe·^]	'open it!'
34.	/'gèk/	[gyɛk̭⁺ /gɛk̭˺]	'hit'
35.	/'kő/	[kʷo·^ /ko·^]	'dig!'
36.	/'gòṭa/	[gwɔ̟ṭa / gɔ̟ṭa]	'laughter'
37.	/'rhé/	[r̠ᵋ̲ɛ·^]	'burn'
38.	/"ty-è/	[ṱʸæ̟·]	'there'
39.	/'sém/	[sɛ^m]	'heart'
40.	/"mè/	[mɛˀ]	'there is not'
41.	/"wè/	[wæˀ]	'there is'
42.	/"ḍòwɑ-p/	[ḍʷɔ̟ᵊ·p˺]	'go (on foot)'
43.	/"wòwɑ-wu/	[wɒ̟ᵊ·u]	'did (you) come?'
44.	/'lɑ́wa/	[lɒ^wa]	'servant'

*The variants of /ɑ/ tend to be shorter than the corresponding variants of the remaining vowel phonemes.

3. Distribution

There is no clustering of vowels within the syllable.